

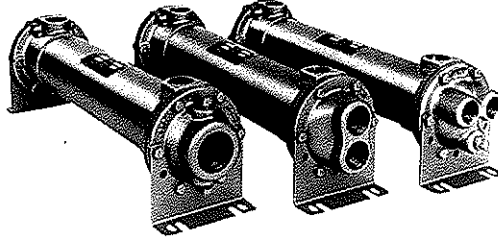
WATER COOLED FIXED BUNDLE/B SERIES

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"/>
Model Series	Model Size Selected	Baffle Spacing	Tube Dia. Code	Tube Side Passes	Shell Material	Cooling Tube Material	End Bonnet Material	Zinc Anodes	
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

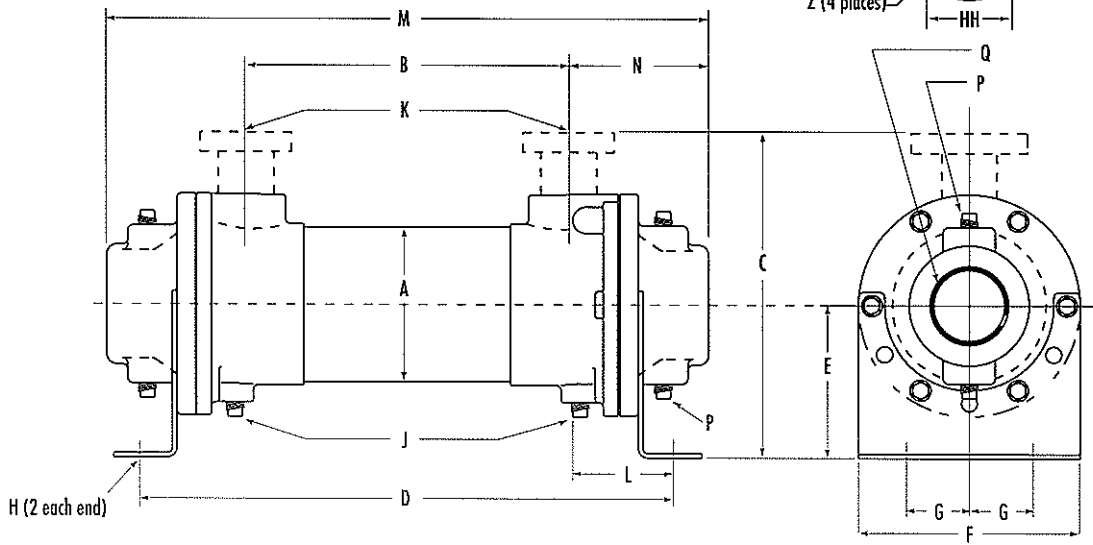
BFM = SAE Flange (with Metric threads) Shell Side connections; BSPP Tube Side connections

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



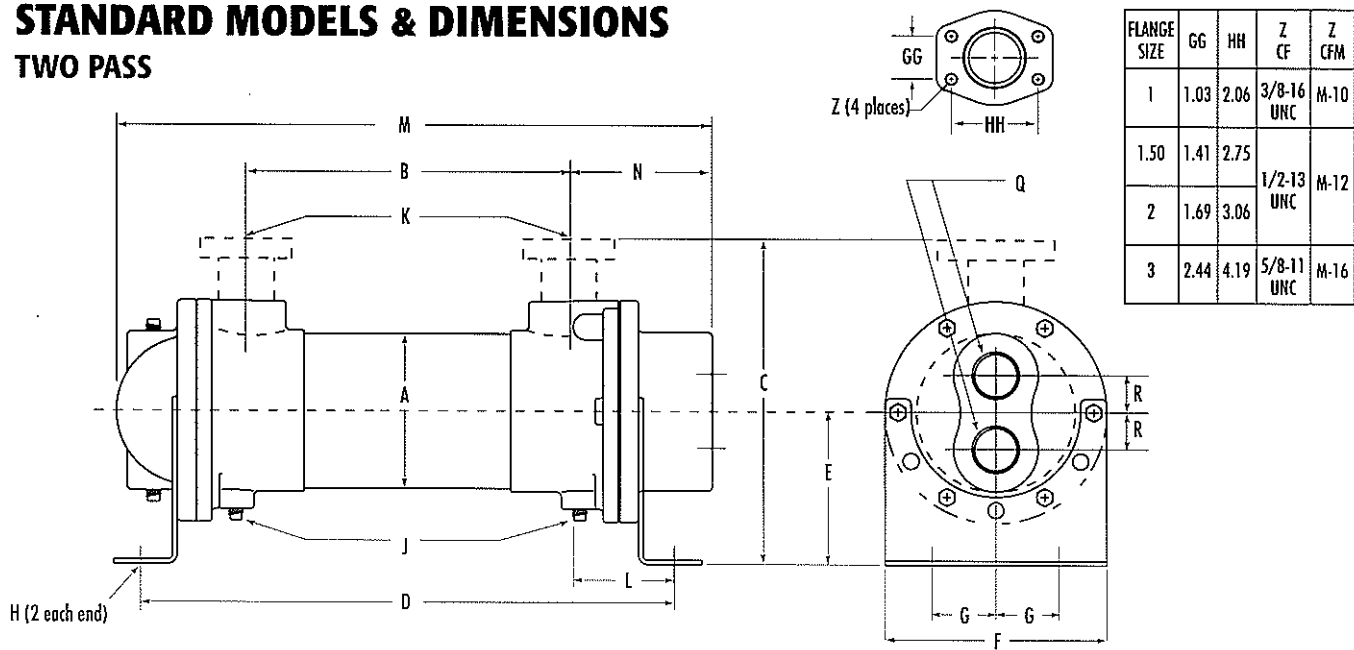
MODEL	A	B	C		D	E	F	G	H	J NPT	K		L	M	N	P NPT	Q NPT
			NPT/BSPP SAE O-RING	SAE FLANGE							NPT/BSPP FLANGE	SAE O-RING					
B-401	2.125	7.62	3.50	—	11.01	1.94	2.62	.88	.41 Dia.	—	.50	#8, 3/4-16 UNF-2B	1.72	11.24	1.81	—	1.00
B-402		16.62			20.01									20.24			
B-701	3.656	7.00	6.25	C/F	12.01	3.62	5.25	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) .50	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.

B/SB water cooled

STANDARD MODELS & DIMENSIONS

TWO PASS



H (2 each end)

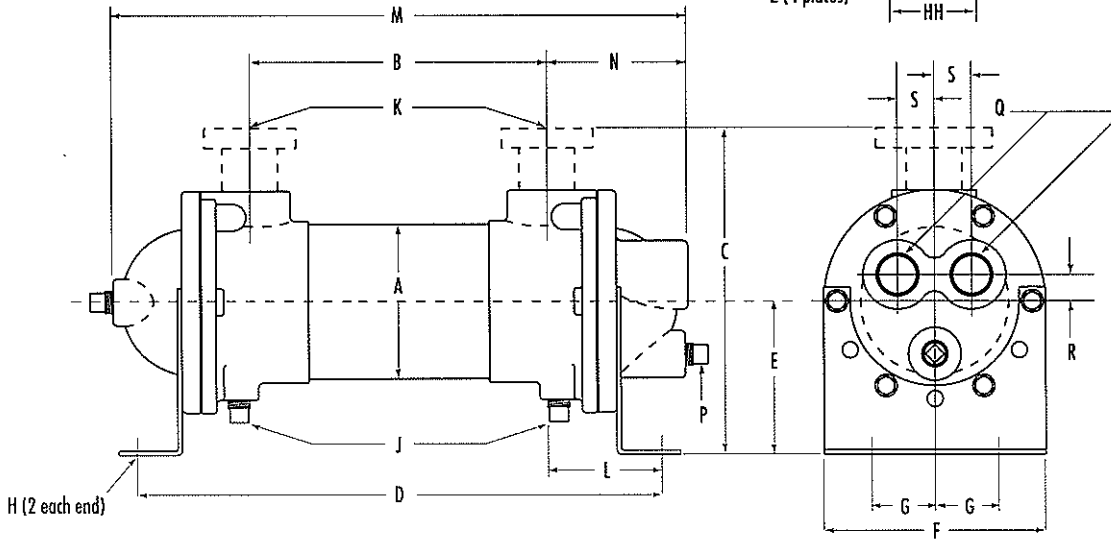
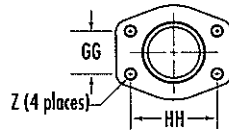
MODEL	A	B	C		D	E	F	G	H	J NPT	K		L	M	N	P NPT	Q NPT	R
			NPT/BSPP SAE O-RING	SAE FLANGE							NPT/BSPP FLANGE	SAE O-RING						
B-701	3.656	7.00	6.25	C/F	12.01	3.62	5.25	1.50	.44 x 1.00	(2) .38	1.00	#16, 1 1/16-12 UNF-2B	2.69	13.28	3.30	(2) .38	1.00	.88
B-702		16.00			21.01									22.28				
B-703		25.00			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 1/8-12 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	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
B/SB

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	5/8-11 UNC	M-16
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	(3) .38	.75	.62	.88
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	.44 x 1.00	(6) .38	1.50	#24, 1 1/8-12 UN-2B	3.06	23.57	4.12	(1) .50	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

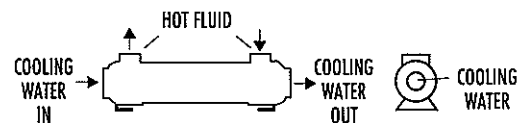
Caution: Incorrect installation can cause this product to fail prematurely, causing the shell-side and tube-side fluids to intermix. Maximum allowable rates are as charted below.

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

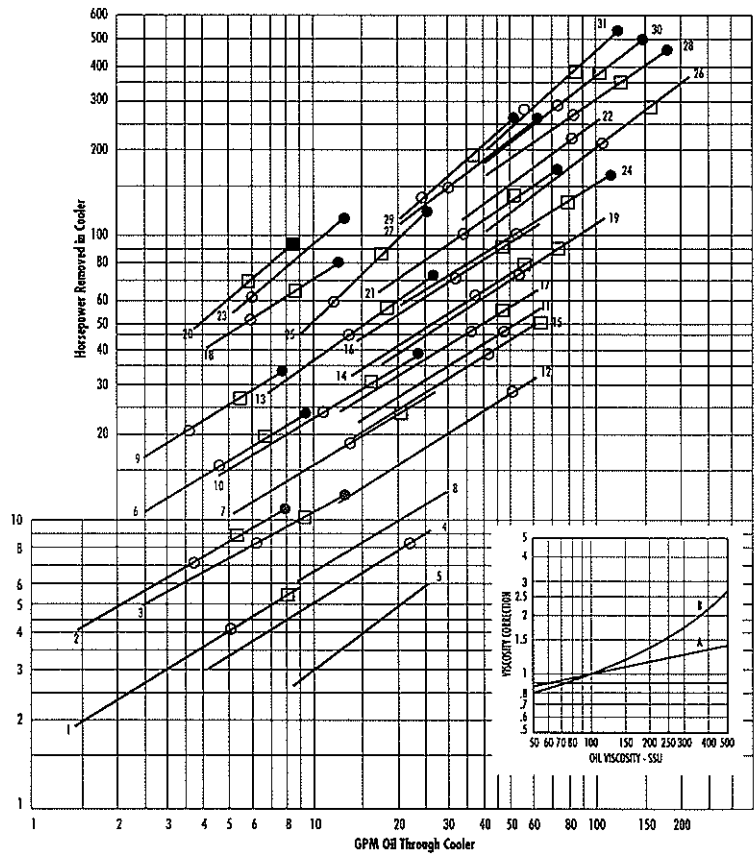
www.hydrothrift.com
sales@hydrothrift.com

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 Δ P
 ○ = 5 PSI
 □ = 10 PSI
 ● = 20 PSI



water cooled
B/SB

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 ΔT) with this formula:
 $Oil \Delta T = (BTU's/Hr.) / (GPM \text{ Oil Flow} \times 210)$

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

$Oil \text{ Leaving Temp.} = Oil \text{ Entering Temp.} - Oil \Delta T$

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.

