

## Basco® Type HT Hub-Design Heat Exchangers.

Available with short lead times, our highly reliable Type HT hub-design heat exchangers feature cost-effective performance in non-ferrous construction. These small-diameter shell and tube models are pre-engineered from the latest standardized components and are available to meet virtually any OEM or industrial requirement.

### Performance notes.

- Suitable for water or other shell side fluids that could cause corrosion in steel shell designs
- Unique hub design allows the maximum number of tubes to be placed within a given shell diameter for maximum heat transfer
- Shell connections are closer to the tubesheet for better tube surface utilization and effective heat transfer
- Domed-shell nozzle design reduces entrance velocity and pressure drop for increased shell flow capability

### Features and specifications.

- Non-ferrous, straight tube, fixed tubesheet design
- One, two, or four pass models
- Available from 2 in. through 8 in. in diameter and up to 8 ft. in standard lengths, with longer options for custom designs
- Tubes roller expanded into tubesheets – holes are drilled and reamed
- Removable mounting feet with slotted holes can be reversed or rotated for quick, easy installation
- Precision-cut baffles provide minimum clearances for maximum heat transfer
- NPT (our standard), SAE O-Ring, SAE Flange, or BSPP shell side connections available and can be rotated in 90-degree increments for specialized applications
- Special models with ANSI flanges are available for either shell or tube side connections
- Type AHT and AHTR models are available in all 316 stainless steel construction, in both straight tube fixed tube sheet design and removable U-tube design
- Type HTR models (brass) can be replaced with Type AHTR models (stainless steel)

### Product nomenclature.

SIZE	5	Y	14
	Shell diameter	Tube OD	Tube length

TYPE	HT/MHT*	1	A	CI
	Core assembly	Tube pass	Baffle space	Bonnet material

\*NOTE: HT is our standard hub product; MHT is our modified hub product.



### Applications.

- Water-to-water
- Lube oil cooling
- Hydraulic oil cooling
- Engine jacket water cooling
- Gas cooling

### Materials of construction.

- SHELL** 2-8 in. brass
- TUBES** 1/4 in., 3/8 in. and 5/8 in. copper, admiralty, 90/10 copper-nickel
- TUBESHEET** Brass
- BONNETS** Cast iron, cast bronze
- BAFFLES** Brass
- BOLTING** Alloy steel
- GASKETS** Compressed fiber
- BRACKETS** Steel

### Standard ratings.

#### DESIGN PRESSURE

Shell side: 300 psi, 2068 kPa

Tube side: 150 psi, 1034 kPa

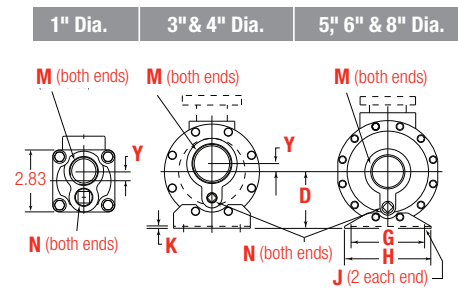
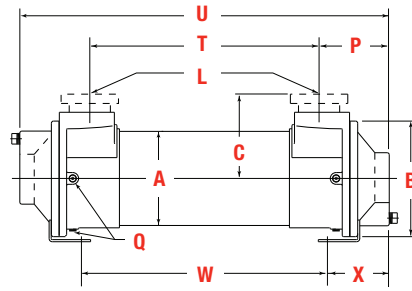
#### TEST PRESSURE

All units are tested pneumatically

#### DESIGN TEMPERATURE

300°F, 149°C

# Dimensions. ONE PASS



## U.S. (in.)

Size	A Dia.	B Dia.	C		D	G	H	J	K	L		M NPT	N NPT	P	Q NPT	T	U	W	X	Y
			NPT/BSPP SAE O-Ring	SAE 4 Bolt Flange						NPT/BSPP Flange	SAE O-Ring									
2-8	2.12	—	1.69	—	—	—	—	—	—	*1.00	N/A	0.75	—	2.38	—	6.25	11.00	—	—	—
3-8	3.12	4.19	2.44	C/F	2.44	2.50	3.50	.38 x .88	—	1.00	#16, 1 5/16 - 12 UNF-2B	1.50	—	2.56	(2) .25	6.12	11.25	5.47	3.06	0.38
3-14	3.12	4.19	2.44													12.12	17.25	11.47		
3-24	3.12	4.19	2.44													22.12	27.25	21.47		
4-14	4.12	5.88	3.12													11.12	18.00	12.88		
4-24	4.12	5.88	3.12	3.50	3.50	4.75	.50 x 1.62	—	1.50	#24, 1 7/8 - 12 UN-2B	2.00	0.38	3.44	(6) .38	21.12	28.00	22.88	2.56	0.50	
4-36	4.12	5.88	3.12												33.12	40.00	34.88			
5-14	5.12	6.50	3.62	4.34	4.00	5.00	.50 x .88	—	1.50	—	2.50	—	3.69	—	11.12	18.50	11.75	3.38	—	
5-24	5.12	6.50	3.62												21.12	28.50	21.75			
5-36	5.12	6.50	3.62	4.34	4.00	5.00	.50 x .88	—	1.50	—	2.50	—	3.69	—	33.12	40.50	33.75	3.38	—	
6-24	6.12	7.50	4.25												20.50	29.00	21.50			
6-36	6.12	7.50	4.25	4.84	4.12	5.00	6.00	—	2.00	#32, 2 1/2 - 12 UN-2B	3.00	0.50	4.25	(6) .25	32.50	41.00	33.50	3.75	—	
6-48	6.12	7.50	4.25												44.50	53.00	45.50			
6-60	6.12	7.50	4.25	4.84	4.12	5.00	6.00	—	2.00	#32, 2 1/2 - 12 UN-2B	3.00	0.50	4.25	(6) .25	56.50	65.00	57.50	3.75	—	
8-24	8.00	9.75	5.62												19.00	31.00	20.50			
8-36	8.00	9.75	5.62	6.12	5.38	7.00	8.25	.62 x 1.12	0.19	3.00	—	—	6.00	—	31.00	43.00	32.50	5.25	—	
8-48	8.00	9.75	5.62												43.00	55.00	44.50			
8-60	8.00	9.75	5.62	6.12	5.38	7.00	8.25	.62 x 1.12	0.19	3.00	—	—	6.00	—	55.00	67.00	56.50	5.25	—	
8-72	8.00	9.75	5.62												67.00	79.00	68.50			

## Metric (mm)

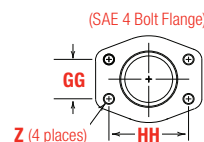
Size	A Dia.	B Dia.	C		D	G	H	J	K	L (in.)		M NPT (in.)	N NPT (in.)	P	Q NPT (in.)	T	U	W	X	Y
			NPT/BSPP SAE O-Ring	SAE 4 Bolt Flange						NPT/BSPP Flange	SAE O-Ring									
2-8	53.85	—	42.93	—	—	—	—	—	—	*1.00	N/A	0.75	—	60.45	—	158.75	279.40	—	—	—
3-8	79.25	106.43	61.98	C/F	61.98	63.50	88.90	9.65 x 22.35	—	1.00	1 5/16 - 12 UNF-2B	1.50	—	65.02	(2) .25	155.45	285.75	138.94	77.72	9.50
3-14	79.25	106.43	61.98													307.85	438.15	291.34		
3-24	79.25	106.43	61.98													561.85	692.15	545.34		
4-14	104.65	149.35	79.25													282.45	457.20	327.15		
4-24	104.65	149.35	79.25	88.90	88.90	120.65	12.70 x 41.15	—	1.50	#24, 1 7/8 - 12 UN-2B	2.00	0.38	87.38	(6) .38	536.45	711.20	581.15	65.02	12.70	
4-36	104.65	149.35	79.25												841.25	1016.00	885.95			
5-14	130.05	165.10	91.95	110.24	101.60	127.00	12.70 x 22.35	—	1.50	—	2.50	—	93.73	—	282.45	469.90	298.45	85.85	—	
5-24	130.05	165.10	91.95												536.45	723.90	552.45			
5-36	130.05	165.10	91.95	110.24	101.60	127.00	12.70 x 22.35	—	1.50	—	2.50	—	93.73	—	841.25	1028.70	857.25	85.85	—	
6-24	155.45	190.50	107.95												520.70	736.60	546.10			
6-36	155.45	190.50	107.95	122.94	104.65	127.00	152.40	—	2.00	#32, 2 1/2 - 12 UN-2B	3.00	0.50	107.95	(6) .25	825.50	1041.40	850.90	95.25	—	
6-48	155.45	190.50	107.95												1130.30	1346.20	1155.70			
6-60	155.45	190.50	107.95	122.94	104.65	127.00	152.40	—	2.00	#32, 2 1/2 - 12 UN-2B	3.00	0.50	107.95	(6) .25	1435.10	1651.00	1460.50	95.25	—	
8-24	203.20	247.65	142.75												482.60	787.40	520.70			
8-36	203.20	247.65	142.75	155.45	136.65	177.80	209.55	15.75 x 28.45	4.83	3.00	—	—	152.40	—	787.40	1092.20	825.50	133.35	—	
8-48	203.20	247.65	142.75												1092.20	1397.00	1130.30			
8-60	203.20	247.65	142.75	155.45	136.65	177.80	209.55	15.75 x 28.45	4.83	3.00	—	—	152.40	—	1397.00	1701.80	1435.10	133.35	—	
8-72	203.20	247.65	142.75												1701.80	2006.60	1739.90			

## Flange Size – U.S. (in.)

Flange Size	GG	HH	Z-CF	Z-CFM
1	1.03	2.06	3/8-16 UNC	M-10
1.5	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

## Flange Size – Metric (mm)

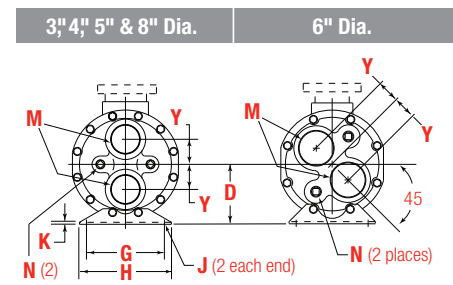
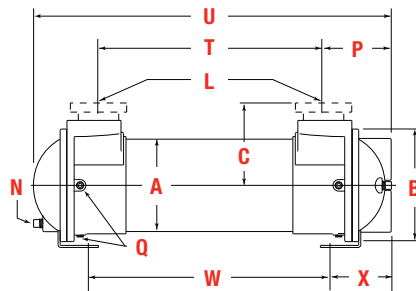
Flange Size	GG	HH	Z-CF	Z-CFM
1	26.16	52.32	3/8-16 UNC	M-10
1.5	35.81	69.85	1/2-13 UNC	M-12
2	42.93	77.72		
3	61.98	106.43	5/8-11 UNC	M-16



\*2-8 SAE Flange not available.

NOTE: We reserve the right to make reasonable design changes without notice. Consult factory. U.S. dimensions are inches. Metric dimensions are millimeters (mm), except connection sizes in L, M, N, and Q.

# Dimensions. TWO PASS



## U.S. (in.)

Size	A Dia.	B Dia.	C		D	G	H	J	K	L		M NPT	N NPT	P	Q NPT	T	U	W	X	Y		
			NPT/BSPP SAE O-Ring	SAE 4 Bolt Flange						NPT/BSPP Flange	SAE O-Ring											
3-8																6.12	10.75	5.47				
3-14	3.12	4.19	2.44	C/F	2.44	2.50	3.50	.38 x .88	0.12	1.00	#16, 1 5/16 - 12 UNF-2B	1.00		2.44	(2) .25	12.12	16.75	11.47	2.94	1.00		
3-24																		22.12	26.75	21.47		
4-14																		11.12	17.62	12.88		
4-24	4.12	5.88	3.12				3.50	4.75		.50 x 1.62		1.25		#24, 1 7/8 - 12 UN-2B	0.38	3.44	(6) .38	21.12	27.62	22.88	2.56	1.19
4-36																33.12	39.62	34.88				
5-14					3.50					1.50						11.12	18.31	11.75				
5-24	5.12	6.50	3.62	4.34		4.00	5.00			1.50			3.69			21.12	28.31	21.75	3.38	1.50		
5-36															33.12	40.31	33.75					
6-24								.50 x .88							20.50	28.75	21.50					
6-36															32.50	40.75	33.50					
6-48	6.12	7.50	4.25	4.84	4.12	5.00	6.00			2.00	#32, 2 1/2 - 12 UN-2B	2.00		4.25	(6) .25	44.50	52.75	45.50	3.75	1.56		
6-60															56.50	64.75	57.50					
8-24													0.50		19.00	30.50	20.50					
8-36															31.00	42.50	32.50					
8-48	8.00	9.75	5.62	6.12	5.38	7.00	8.25	.62 x 1.12	0.19	3.00	—	2.50		6.00		43.00	54.50	44.50	5.25	2.25		
8-60															55.00	66.50	56.50					
8-72															67.00	78.50	68.50					

## Metric (mm)

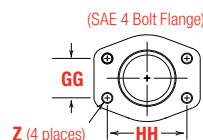
Size	A Dia.	B Dia.	C		D	G	H	J	K	L (in.)		M NPT (in.)	N NPT (in.)	P	Q NPT (in.)	T	U	W	X	Y		
			NPT/BSPP SAE O-Ring	SAE 4 Bolt Flange						NPT/BSPP Flange	SAE O-Ring											
3-8																155.45	273.05	138.94				
3-14	79.25	106.43	61.98	C/F	61.98	63.50	88.90	9.65 x 22.35	3.05	1.00	#16, 1 5/16 - 12 UNF-2B	1.00		61.98	(2) .25	307.85	425.45	291.34	74.68	25.40		
3-24																		561.85	679.45	545.34		
4-14																		282.45	447.55	327.15		
4-24	104.65	149.35	79.25				88.90	120.65		12.70 x 41.15		1.25		#24, 1 7/8 - 12 UN-2B	0.38	87.38	(6) .38	536.45	701.55	581.15	65.02	30.23
4-36																841.25	1006.35	885.95				
5-14					88.90					1.50						282.45	465.07	298.45				
5-24	130.05	165.10	91.95	110.24		101.60	127.00			1.50			93.73			536.45	719.07	552.45	85.85	38.10		
5-36															841.25	1023.87	857.25					
6-24								12.70 x 22.35							520.70	730.25	546.10					
6-36															825.50	1035.05	850.90					
6-48	155.45	190.50	107.95	122.94	104.65	127.00	152.40			2.00	#32, 2 1/2 - 12 UN-2B	2.00		107.95	(6) .25	1130.30	1339.85	1155.70	95.25	39.62		
6-60															1435.10	1644.65	1460.50					
8-24													0.50		482.60	774.70	520.70					
8-36															787.40	1079.50	825.50					
8-48	203.20	247.65	142.75	155.45	136.65	177.80	209.55	15.75 x 28.45	4.83	3.00	—	2.50		152.40		1092.20	1384.30	1130.30	133.35	57.15		
8-60															1397.00	1689.10	1435.10					
8-72															1701.80	1993.90	1739.90					

## Flange Size – U.S. (in.)

Flange Size	GG	HH	Z-CF	Z-CFM
1	1.03	2.06	3/8-16 UNC	M-10
1.5	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

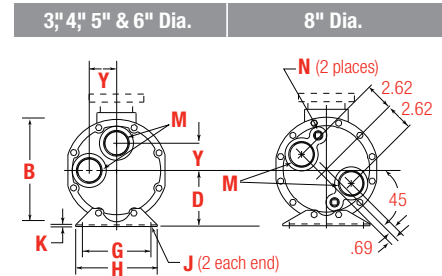
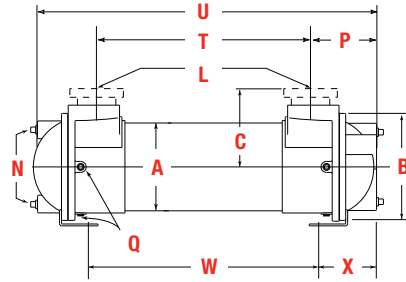
## Flange Size – Metric (mm)

Flange Size	GG	HH	Z-CF	Z-CFM
1	26.16	52.32	3/8-16 UNC	M-10
1.5	35.81	69.85	1/2-13 UNC	M-12
2	42.93	77.72	5/8-11 UNC	M-16
3	61.98	106.43	5/8-11 UNC	M-16



NOTE: We reserve the right to make reasonable design changes without notice. Consult factory. U.S. dimensions are inches. Metric dimensions are millimeters (mm), except connection sizes in L, M, N, and Q.

# Dimensions. FOUR PASS



For the orientation of all 8 in. diameter 4-pass units with 1/4 in. tubes, please contact factory.

## U.S. (in.)

Size	A Dia.	B Dia.	C		D	G	H	J	K	L		M NPT	N NPT	P	Q NPT	T	U	W	X	Y	
			NPT/BSPP SAE O-Ring	SAE 4 Bolt Flange						NPT/BSPP Flange	SAE O-Ring										
3-8																					
3-14	3.12	4.19	2.44		2.44	2.50	3.50	.38 x .88		1.00	#16, 1 5/16 - 12 UNF-2B			2.31	(2) .25	6.12	10.88	5.47			
3-24				C/F								0.75			22.12	26.88	21.47				
4-14															3.44	(6) .38	11.12	17.62	12.88		
4-24	4.12	5.88	3.12			3.50	4.75	.50 x 1.62				0.38			21.12	27.62	22.88		2.56	1.06	
4-36																33.12	39.62	34.88			
5-14					3.50				0.12	1.50	#24, 1 7/8 - 12 UN-2B				11.12	18.38	11.75				
5-24	5.12	6.50	3.62			4.00	5.00					1.00		3.56	21.12	28.38	21.75		3.25	1.69	
5-36																33.12	40.38	33.75			
6-24								.50 x .88				1.50			20.50	29.00	21.50				
6-36	6.12	7.50	4.25		4.12	5.00	6.00								4.25	32.50	41.00	33.50		3.75	2.00
6-48												2.00			44.50	53.00	45.50				
6-60															(6) .25	56.50	65.00	57.50			
8-24												0.50			19.00	30.75	20.50				
8-36																31.00	42.75	32.50			
8-48	8.00	9.75	5.62		5.38	7.00	8.25	.62 x 1.12	0.19	3.00	—	2.00		6.00	43.00	54.75	44.50		5.25	—	
8-60																55.00	66.75	56.50			
8-72															67.00	78.75	68.50				

## Metric (mm)

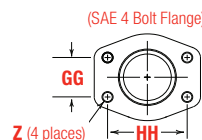
Size	A Dia.	B Dia.	C		D	G	H	J	K	L (in.)		M NPT (in.)	N NPT (in.)	P	Q NPT (in.)	T	U	W	X	Y	
			NPT/BSPP SAE O-Ring	SAE 4 Bolt Flange						NPT/BSPP Flange	SAE O-Ring										
3-8																					
3-14	79.25	106.43	61.98		61.98	63.50	88.90	9.65 x 22.35		1.00	#16, 1 5/16 - 12 UNF-2B			58.67	(2) .25	155.45	276.35	138.94			
3-24				C/F								0.75			282.45	447.55	327.15				
4-14																87.38	(6) .38	536.45	701.55	581.15	65.02
4-24	104.65	149.35	79.25			88.90	120.65	12.70 x 41.15				0.38			841.25	1006.35	885.95				
4-36					88.90				3.05	1.50	#24, 1 7/8 - 12 UN-2B					282.45	466.85	298.45			
5-14												1.00			841.25	1025.65	857.25				
5-24	130.05	165.10	91.95			101.60	127.00								90.42	536.45	720.85	552.45	82.55	42.93	
5-36												1.50			841.25	1025.65	857.25				
6-24								12.70 x 22.35								520.70	736.60	546.10			
6-36												2.00			825.50	1041.40	850.90				
6-48	155.45	190.50	107.95		104.65	127.00	152.40								107.95	1130.30	1346.20	1155.70		95.25	50.80
6-60												1.50			1435.10	1651.00	1460.50				
8-24															(6) .25	482.60	781.05	520.70			
8-36												0.50			787.40	1085.85	825.50				
8-48	203.20	247.65	142.75		136.65	177.80	209.55	15.75 x 28.45	4.83	3.00	—				152.40	1092.20	1390.65	1130.30	133.35	—	
8-60												2.00			1397.00	1695.45	1435.10				
8-72																1701.80	2000.25	1739.90			

## Flange Size – U.S. (in.)

Flange Size	GG	HH	Z-CF	Z-CFM
1	1.03	2.06	3/8-16 UNC	M-10
1.5	1.41	2.75		
2	1.69	3.06	1/2-13 UNC	M-12
3	2.44	4.19	5/8-11 UNC	M-16

## Flange Size – Metric (mm)

Flange Size	GG	HH	Z-CF	Z-CFM
1	26.16	52.32	3/8-16 UNC	M-10
1.5	35.81	69.85		
2	42.93	77.72	1/2-13 UNC	M-12
3	61.98	106.43	5/8-11 UNC	M-16



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