

流体冷却 管壳式 HC 系列

铜管/碳钢壳体结构

产品特点

- 新的水-油项目推荐采用本系列
- 钢制结构，结实耐用
- 极具性价比
- 壳侧接口有NPT, SAE O-Ring, SAE 法兰以及BSPP可选
- 封头可拆卸，便于换热管的清洗
- 特殊的安装支架设计，使换热器能够以90°角旋转



可选配置

换热管、管板与封头
有多种材质可选

额定参数

最大工作压力 - 壳侧
300 PSI (20 BAR)

最大工作压力 - 管侧
150 PSI (10 BAR)

最高工作温度
300°F (150 C)

材质

换热管 紫铜、CuNi白铜、不锈钢、海军铜

管板 碳钢、CuNi白铜、不锈钢

壳体 碳钢

折流板 碳钢

封头 铸铁、铸青铜、不锈钢

安装支架 碳钢

密封垫片 丁晴橡胶或压缩纤维

铭牌 塑纸

产品型号

产品系列	产品规格	折流板间距	换热管直径	管侧流程数	换热管材质	封头材质	管板材质	防腐锌棒
HC HCS HCF HCM HCA HCFM			4 - 1/4" (600与800系列标配) 6 - 3/8" (1000、1200与1700系列标配)	0 - 单流程 T - 双流程 F - 四流程	空白 - 紫铜 CN - CuNi(白铜) SS - 不锈钢 AD - 海军铜	空白 - 铸铁 B - 铸青铜 SB - 不锈钢	空白 - 碳钢 W - CuNi(白铜) S - 不锈钢	空白 - 无 Z - 带锌棒

HC = NPT壳侧接口; NPT管侧接口

HCS = SAE O型圈密封壳侧接口; NPT管侧接口

HCF = SAE Code 61法兰(美制螺栓孔); NPT管侧接口

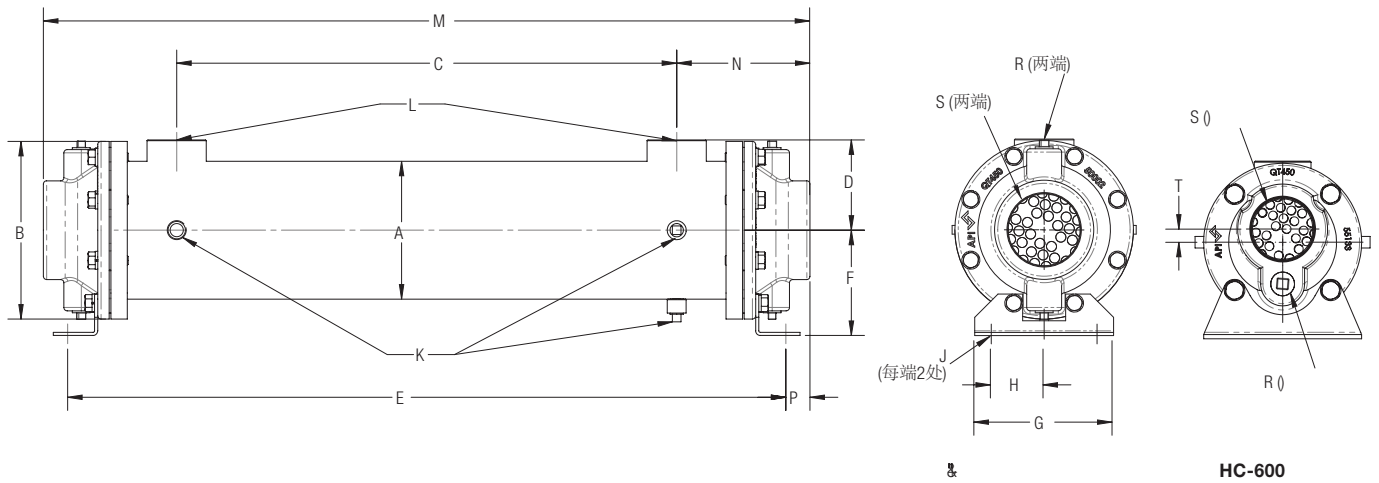
HCM = BSPP壳侧接口; BSPP管侧接口

*HCA = 150# ASME RF法兰壳侧接口; NPT管侧接口。壳侧最高压力等级150 PSI (10 BAR)

HCFM = SAE Code 61法兰壳侧接口(公制螺栓孔); NPT管侧接口

外形尺寸

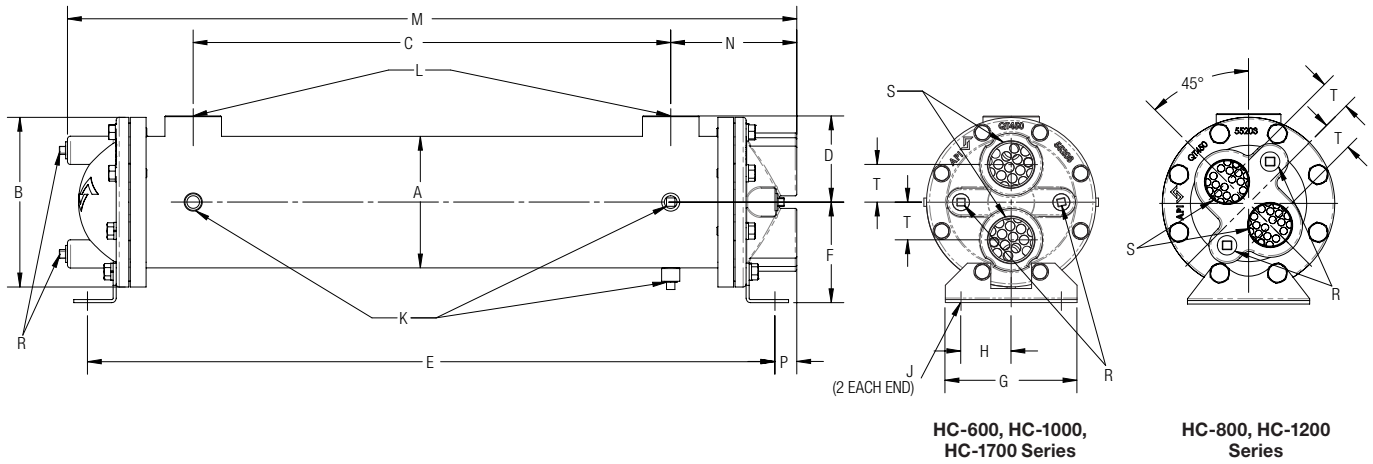
单流程



Model	A	B	C	D	E	F	G	H	J	K NPT	L NPT	M	N	P	R NPT	S NPT	T
614	3.27	4.50	10.00	2.31	16.37	2.75	4.50	1.63	0.44	0.25	1.00	17.31	3.66	0.47	.38 (2)	1.50	0.38
624	3.27	4.50	20.00	2.31	26.37	2.75	4.50	1.63	0.44	0.25	1.00	27.31	3.66	0.47	.38 (2)	1.50	0.38
814	4.25	6.00	9.00	3.13	16.50	3.50	4.25	1.75	0.44	0.25	1.50	17.88	4.44	0.69	.38 (2)	2.00	—
824	4.25	6.00	19.00	3.13	26.50	3.50	4.25	1.75	0.44	0.25	1.50	27.88	4.44	0.69	.38 (2)	2.00	—
836	4.25	6.00	31.00	3.13	38.50	3.50	4.25	1.75	0.44	0.25	1.50	39.88	4.44	0.69	.38 (2)	2.00	—
1014	5.24	6.75	9.00	3.43	17.29	4.00	5.25	2.00	.50 x .75	0.25	1.50	19.13	5.06	0.92	.38 (4)	2.00	—
1024	5.24	6.75	19.00	3.43	27.29	4.00	5.25	2.00	.50 x .75	0.25	1.50	29.13	5.06	0.92	.38 (4)	2.00	—
1036	5.24	6.75	31.00	3.43	39.29	4.00	5.25	2.00	.50 x .75	0.25	1.50	41.13	5.06	0.92	.38 (4)	2.00	—
1224	6.26	7.75	18.25	4.06	27.00	4.50	6.25	2.50	.50 x .75	0.38	2.00	29.63	5.69	1.31	.50 (4)	3.00	—
1236	6.26	7.75	30.25	4.06	39.00	4.50	6.25	2.50	.50 x .75	0.38	2.00	41.63	5.69	1.31	.50 (4)	3.00	—
1248	6.26	7.75	42.25	4.06	51.00	4.50	6.25	2.50	.50 x .75	0.38	2.00	53.63	5.69	1.31	.50 (4)	3.00	—
1260	6.26	7.75	55.25	4.06	63.00	4.50	6.25	2.50	.50 x .75	0.38	2.00	65.63	5.69	1.31	.50 (4)	3.00	—
1724	8.62	10.50	17.00	5.43	27.25	5.75	7.25	3.50	.63 x .88	0.38	3.00	31.75	7.38	2.25	.50 (4)	4.00	—
1736	8.62	10.50	29.00	5.43	39.25	5.75	7.25	3.50	.63 x .88	0.38	3.00	43.75	7.38	2.25	.50 (4)	4.00	—
1748	8.62	10.50	41.00	5.43	51.25	5.75	7.25	3.50	.63 x .88	0.38	3.00	55.75	7.38	2.25	.50 (4)	4.00	—
1760	8.62	10.50	53.00	5.43	63.25	5.75	7.25	3.50	.63 x .88	0.38	3.00	67.75	7.38	2.25	.50 (4)	4.00	—
1772	8.62	10.50	65.00	5.43	75.25	5.75	7.25	3.50	.63 x .88	0.38	3.00	79.75	7.38	2.25	.50 (4)	4.00	—

Dimensions

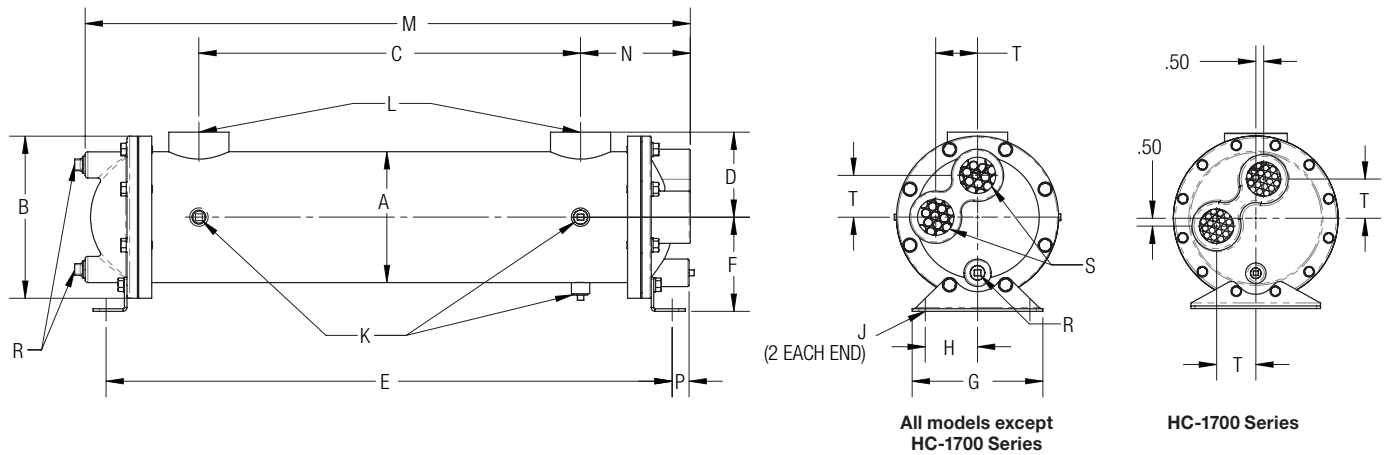
Two Pass



Model	A	B	C	D	E	F	G	H	J	K NPT	L NPT	M	N	P	R NPT	S NPT	T
614	3.27	4.50	10.00	2.31	16.37	2.75	4.50	1.63	0.44	0.25	1.00	17.20	3.64	0.45	.38 (4)	1.00	1.00
624	3.27	4.50	20.00	2.31	26.37	2.75	4.50	1.63	0.44	0.25	1.00	27.20	3.64	0.45	.38 (4)	1.00	1.00
814	4.25	6.00	9.00	3.13	16.56	3.50	4.25	1.75	0.44	0.25	1.50	17.88	4.44	0.69	.38 (4)	1.25	1.06
824	4.25	6.00	19.00	3.13	26.56	3.50	4.25	1.75	0.44	0.25	1.50	27.88	4.44	0.69	.38 (4)	1.25	1.06
836	4.25	6.00	31.00	3.13	38.56	3.50	4.25	1.75	0.44	0.25	1.50	39.88	4.44	0.69	.38 (4)	1.25	1.06
1014	5.24	6.75	9.00	3.43	17.35	4.00	5.25	2.00	.50 x .75	0.25	1.50	19.02	5.02	0.87	.38 (4)	1.50	1.50
1024	5.24	6.75	19.00	3.43	27.35	4.00	5.25	2.00	.50 x .75	0.25	1.50	29.02	5.02	0.87	.38 (4)	1.50	1.50
1036	5.24	6.75	31.00	3.43	39.35	4.00	5.25	2.00	.50 x .75	0.25	1.50	41.02	5.02	0.87	.38 (4)	1.50	1.50
1224	6.26	7.75	18.25	4.06	27.06	4.50	6.25	2.50	.50 x .75	0.38	2.00	28.94	5.25	0.88	.38 (2 - 1/0) .50 (2 - RET)	2.00	1.56
1236	6.26	7.75	30.25	4.06	39.06	4.50	6.25	2.50	.50 x .75	0.38	2.00	40.94	5.25	0.88		2.00	1.56
1248	6.26	7.75	42.25	4.06	51.06	4.50	6.25	2.50	.50 x .75	0.38	2.00	52.94	5.25	0.88		2.00	1.56
1260	6.26	7.75	55.25	4.06	63.06	4.50	6.25	2.50	.50 x .75	0.38	2.00	64.94	5.25	0.88		2.00	1.56
1724	8.62	10.50	17.00	5.43	27.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	30.07	7.20	2.08	.50 (4)	2.50	2.25
1736	8.62	10.50	29.00	5.43	39.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	42.07	7.20	2.08	.50 (4)	2.50	2.25
1748	8.62	10.50	41.00	5.43	51.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	54.07	7.20	2.08	.50 (4)	2.50	2.25
1760	8.62	10.50	53.00	5.43	63.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	66.07	7.20	2.08	.50 (4)	2.50	2.25
1772	8.62	10.50	65.00	5.43	75.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	78.07	7.20	2.08	.50 (4)	2.50	2.25

Dimensions

Four Pass

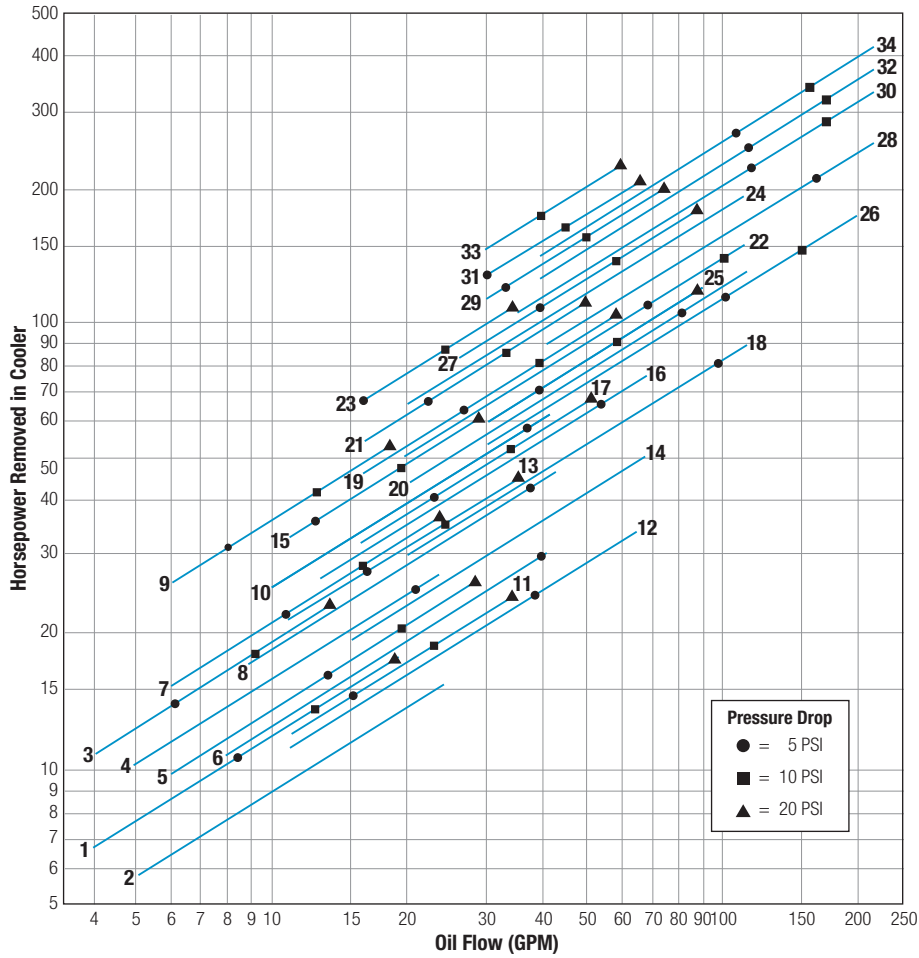


All models except
HC-1700 Series

HC-1700 Series

Model	A	B	C	D	E	F	G	H	J	K NPT	L NPT	M	N	P	R NPT	S NPT	T
614	3.27	4.50	10.00	2.31	16.37	2.75	4.50	1.63	0.44	0.25	1.00	17.19	3.62	0.44	.38 (2)	0.75	1.00
624	3.27	4.50	20.00	2.31	26.37	2.75	4.50	1.63	0.44	0.25	1.00	27.19	3.62	0.44	.38 (2)	0.75	1.00
814	4.25	6.00	9.00	3.13	16.56	3.50	4.25	1.75	0.44	0.25	1.50	17.87	4.44	0.69	.38 (3)	0.75	1.25
824	4.25	6.00	19.00	3.13	26.56	3.50	4.25	1.75	0.44	0.25	1.50	27.87	4.44	0.69	.38 (3)	0.75	1.25
836	4.25	6.00	31.00	3.13	38.56	3.50	4.25	1.75	0.44	0.25	1.50	39.87	4.44	0.69	.38 (3)	0.75	1.25
1014	5.24	6.75	9.00	3.43	17.35	4.00	5.25	2.00	.50 x .75	0.25	1.50	18.83	4.83	0.69	.38 (3)	1.00	1.69
1024	5.24	6.75	19.00	3.43	27.35	4.00	5.25	2.00	.50 x .75	0.25	1.50	28.83	4.83	0.69	.38 (3)	1.00	1.69
1036	5.24	6.75	31.00	3.43	39.35	4.00	5.25	2.00	.50 x .75	0.25	1.50	40.83	4.83	0.69	.38 (3)	1.00	1.69
1224	6.26	7.75	18.25	4.06	27.07	4.50	6.25	2.50	.50 x .75	0.38	2.00	28.94	5.25	0.87	.38 (3)	1.50	2.00
1236	6.26	7.75	30.25	4.06	39.07	4.50	6.25	2.50	.50 x .75	0.38	2.00	40.94	5.25	0.87	.38 (3)	1.50	2.00
1248	6.26	7.75	42.25	4.06	51.07	4.50	6.25	2.50	.50 x .75	0.38	2.00	52.94	5.25	0.87	.38 (3)	1.50	2.00
1260	6.26	7.75	55.25	4.06	64.07	4.50	6.25	2.50	.50 x .75	0.38	2.00	65.94	5.25	0.87	.38 (3)	1.50	2.00
1724	8.62	10.50	17.00	5.43	27.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	30.70	7.20	2.08	.38 (3)	2.00	2.50
1736	8.62	10.50	29.00	5.43	39.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	42.70	7.20	2.08	.38 (3)	2.00	2.50
1748	8.62	10.50	41.00	5.43	51.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	54.70	7.20	2.08	.38 (3)	2.00	2.50
1760	8.62	10.50	53.00	5.43	63.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	66.70	7.20	2.08	.38 (3)	2.00	2.50
1772	8.62	10.50	65.00	5.43	75.31	5.75	7.25	3.50	.63 x .88	0.38	3.00	78.70	7.20	2.08	.38 (3)	2.00	2.50

Performance Curves



Curve Number	Model	Shipping Weight (LBS)
1	HC-614-1.3-4-F	17
2	HC-614-3-4-F	17
3	HC-624-1.3-4-F	24
4	HC-624-3-4-F	24
5	HC-814-1.7-4-F	32
6	HC-814-4-4-F	32
7	HC-824-1.7-4-F	41
8	HC-824-4-4-F	41
9	HC-836-1.7-4-F	53
10	HC-836-4-4-F	53
11	HC-1014-2-6-F	43
12	HC-1014-5-6-F	43
13	HC-1024-2-6-F	57
14	HC-1024-5-6-F	57
15	HC-1036-2-6-F	72
16	HC-1036-5-6-F	72
17	HC-1224-2.5-6-F	85
18	HC-1224-6-6-F	85
19	HC-1236-2.5-6-F	110
20	HC-1236-6-6-F	110
21	HC-1248-2.5-6-F	135
22	HC-1248-6-6-F	135
23	HC-1260-2.5-6-F	160
24	HC-1260-6-6-F	160
25	HC-1724-3.5-6-F	140
26	HC-1724-8.4-6-F	140
27	HC-1736-3.5-6-F	180
28	HC-1736-8.4-6-F	180
29	HC-1748-3.5-6-F	220
30	HC-1748-8.4-6-F	220
31	HC-1760-3.5-6-F	260
32	HC-1760-8.4-6-F	260
33	HC-1772-3.5-6-F	300
34	HC-1772-8.4-6-F	300

Shipping weights are approximate.

Selection Procedure

Performance Curves are based on 100SSU oil leaving the cooler 40°F higher than the incoming water temperature (40°F approach temperature). Curves are based on a 2:1 oil to water ratio.

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

STEP 3 Determine Curve Horsepower Heat Load. Enter the information from above:
 $HP \text{ heat load} \times \frac{40}{\text{Actual Approach}} \times \frac{\text{Viscosity}}{\text{Correction A}} = \text{Curve Horsepower}$

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

Oil Temperature

Oil coolers can be selected by using entering or leaving oil temperatures.

Typical operating temperature ranges are:

Hydraulic Motor Oil	110°F - 130°F
Hydrostatic Drive Oil	130°F - 180°F
Lube Oil Circuits	110°F - 130°F
Automatic Transmission Fluid	200°F - 300°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 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:

$$\text{Oil } \Delta T = (\text{BTUs/HR}) / (\text{GPM Oil Flow} \times 210)$$

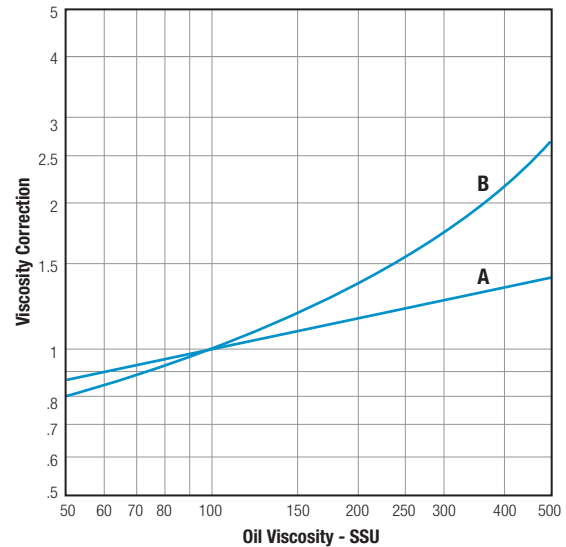
To calculate the oil leaving temperature from the cooler, use this formula:

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

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.

Viscosity Correction



Maximum Flow Rates

Example Model No.
HC - 1024 - 2 - 6 - F

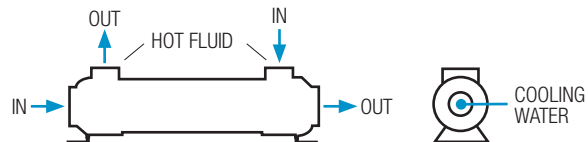
Unit Size	Baffle Spacing	Shell Side (GPM)	Tube Side (GPM)		
			O	T	F
600	1.3, 3	19, 29	48	24	12
800	1.7, 4	32, 69	84	42	21
1000	2, 5	41, 69	146	73	37
1200	2.5, 6	60, 115	224	112	56
1700	3.5, 8.4	125, 253	465	232	116

Exceptions to Maximum Shell Side Flows	
HC-814-4-4-*	63 GPM Max.
HC-1014-2-6-*	33 GPM Max.
HC-1014-5-6-*	66 GPM Max.
HC-1724-3.5-6-*	105 GPM Max.
HC-1724-8.4-6-*	200 GPM Max.

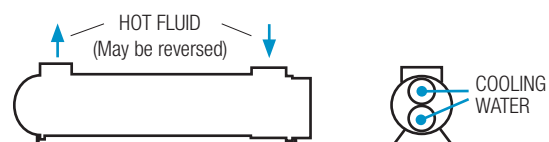
Caution: Incorrect installation can cause this product to fail prematurely, causing the shell side and tube side fluids to intermix.

Piping Diagram

One Pass



Two and Four Pass



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