我們的證書

2021版

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TTP AN API HEAT TRANSFER COMPANY

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銀科工業(香港)有限公司，總部位於香港,分公司和工廠設於中國內地。公司的主要業務為生產和進出口銷售、銀科工業的產品被廣泛應用於鐵路、航空、船舶工業、能源、國防工業、石油化工、環保工業、食品加工和各類機械工業等領域。

・生產和銷售高品質工業傳動零部件，出口至世界各國
・進口德國、瑞士、意大利、美國、日本、台灣等地生產的高科技工業產品，並且是這些世界級著名品牌的大中華總代理。

累計超過20年以上服務海內外客戶的經驗，我們不斷進步，總結，發展，因此而奠定了堅實的基礎，在海內外業界均享有優質的口碑，在系統化培訓和員工對企業的歸屬感，大家分別工作於香港、東莞、上海、成都、深圳，今天的銀科工業已擁有一支非常專業的團隊，為海內外工業界提供優質產品,為貼近客戶而盡我們所能。

Silvertech Industrial (HK) Ltd. with its headquarters in Hong Kong and branches as well as factories in mainland China. Our business focuses on the production/export and import of high quality power transmission parts. These products can be applied to railway, aerospace, marine industry, energy, defends industry, chemistry, food/beverage, environmental production and machinery industries, etc.

- From our own production: our products are well known in the local market in China as well as in the global markets, such as European and North American countries.
- From import: We are the sole authorised distributor in the Greater China area for many world-renowned high-tech industrial products from Germany, Switzerland, Italy, USA, Japan and Taiwan.

We are growing stronger with over twenty years experience of serving clients in overseas and Greater China Area. Silvertech Industrial has well developed world reputation and brand loyalty. Our company engages in systemic on the job training and invests in corporate human resource. We have developed an extremely competent and dedicated team working in Hong Kong, Dongguan, Shanghai, Chengdu, Shenzhen. We are known as the company providing the best products and service for our customers.

我們的地理位置分佈

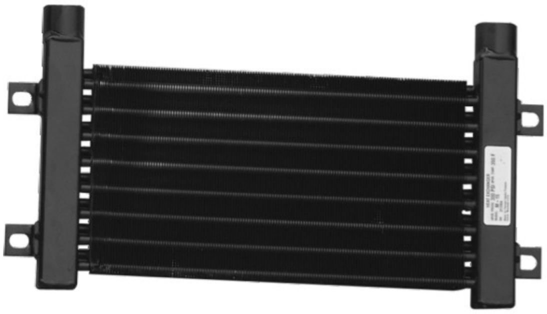
目錄 Directory

大中華總代理

TTP
AN **API** HEAT TRANSFER COMPANY

美國熱動力油冷卻器

美國“熱傳導”牌高性能油冷卻器



熱交換器 | Shell & Tube EK Series 列管式EK系列

COPPER & STEEL CONSTRUCTION 銅和鋼構造

Features 優點

- **Compact Size** 節省空間
- **High Efficiency Finned Bundle Design** 高性能的鰭狀散熱片
- **Low Cost** 低成本
- **Optional Patented Built-in Surge-Cushion® Relief Bypass** 世界專利的內置旁通泄壓閥
- **3/16" Tube Size** 配備3/16"銅管，大量增加熱交換面積
- Heat Removal up to 400 Horsepower (300 kW) 能移走400Hp(300Kw)的熱能
- Oil Flow rates up to 80 U.S. GPM (300 Liters/min.) 油流量達300公升
- Large Oil Connections for Minimum Entering and Exiting Flow Restriction 特大的油接口設計，能大量減少油在進出時的流量損耗
- Removable End Bonnets for easy tube cleaning 可裝拆的端蓋，方便清洗
- Mounting Brackets Designed so that Cooler can be Rotated in 90° Increments 活動式固定支架，最大安裝角度達90°
- High Pressure Ratings 高工作壓力
- Complete Line of Accessories Available 可配備周全的附件

Cutaway view shows high performance copper tube/aluminum fin cooling chamber with patented SURGE-CUSHION® relief bypass valve.

剖視圖片可以看到高性能的銅管和鰭狀散熱片及世界專利的內置旁通泄壓閥。

Ratings 範圍

Operating Pressure/Shell side 500 psi
工作壓力/外殼達35kg/cm²

Operating Pressure/Tubeshell side 150 psi
工作壓力/列管達10.5kg/cm²

Operating Temperature 250° F
工作溫度120C°

Materials 材料

Shell Steel 鋼制外殼

Tube Sheets Steel 鋼制列管端支架

Baffles Steel 鋼制列管支架

Mounting Brackets Steel 鋼制固定支架

Gaskets Nitrile Rubber/Cellulose Fiber
丁晴橡膠纖維制密封圈

Nameplate Aluminum Foil 鋁制名牌

Tubes Copper 銅制列管

Fins Aluminum 鋁制鰭片

End Caps Grey Iron 鑄鐵制端蓋

Surge-Cushion (Option)

內置旁通泄壓閥(備選裝置)

The SURGE-CUSHION® is a protective device (patented) designed to internally bypass a portion of the oil flow during cold start conditions, or when sudden flow surges temporarily exceed the maximum flow allowed for a given cooler. This device may replace an external bypass valve, but it is not intended to bypass the total oil flow.

內置旁通泄壓閥的功能是它可以泄放(旁通)部份當系統在運行中所產生的瞬間特大油流量，使之系統不於因此而增加背壓。TTP公司以此偉大發明已注册了世界專利。

Maximum Flow Rates

Unit Size	Shell Side GPM	Tube Side GPM One Pass	Tube Side GPM Two Pass	Tube Side GPM Four Pass
500	20	13	6	N/A
700	60	24	12	6
1000	80	56	28	14

Incorrect installation can cause premature failure.

選型指南

How to Order

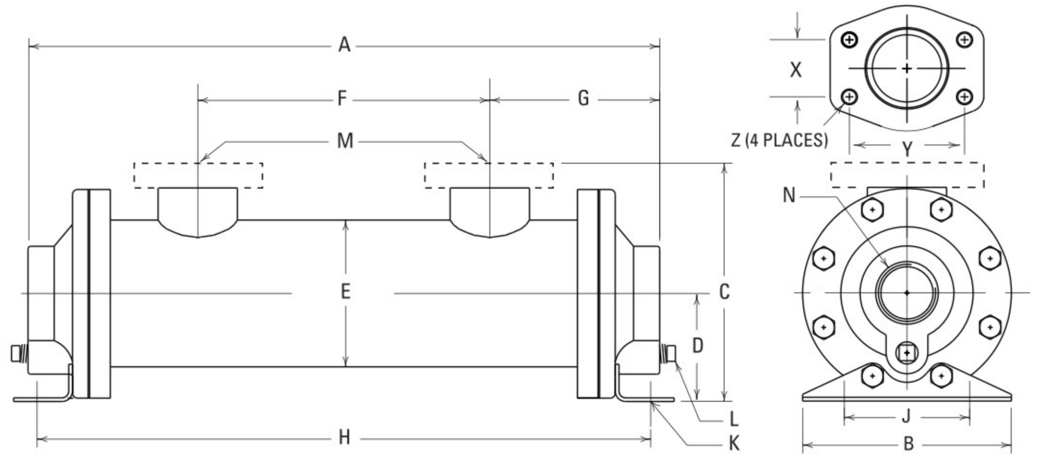
系列 Model Series	規格 Model Size Selected	內擋油板 Baffle Spacing	水管流程 Tubeside Passes	內置旁通閥 Surge Cushion	水管材料 Cooling Tube Material	列管端支架材料 Tube Sheets Material	閥門蓋材料 End Bonnet Material
EK EKS EKM EKF EKFM		EK-1036 & EK-1048 Models Only	**0** - One Pass **T** - Two Pass **F** - Four Pass	**Blank** - No Relief Bypass 空白 – 無旁通閥 **R** - Relief Bypass R – 內置旁通閥	**Blank** - Copper 空白 – 銅 **CN** - CuNi CN – 銅鎳	**Blank** - Steel 空白 – 鋼 **W** - CuNi W – 銅鎳	**Blank** - Cast Iron 空白 – 鑄鐵 **NP** - Electroless Nickel Plate NP – 無電解鍍鎳層

EK = NPT Oil connections; NPT Water connections.
EKS = SAE O-Ring Oil connections; NPT Water connections.
EKM = BSPP Oil connections; BSPP Water connections.
EKF = SAE 4 Bolt Flange (Tapped SAE) Oil connections; NPT Water connections.
EKFM = SAE 4 Bolt Flange (Tapped Metric) Oil connections; BSPP Water connections.

EK =NPT 油接口；NPT 水接口。
EKS = SAE O型圈油接口；NPT 水接口。
EKM =BSPP 油接口；BSPP 水接口。
EKF =SAE 4 螺栓法藍(已攻牙SAE) 油接口；NPT 水接口。
EKFM =SAE 4 螺栓法藍(已攻牙SAE) 油接口；BSPP 水接口。

Dimensions

One Pass



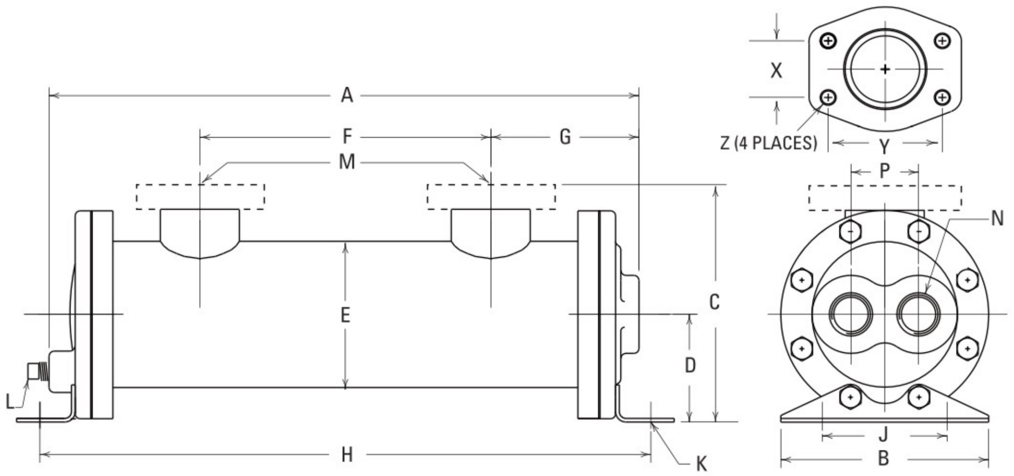
Flange Size	1-1/2	2
X	1.41	1.69
Y	2.75	3.06
EKF Z	1/2 - 13 UNC-28	
EKFM Z	M-12	

MODEL	A	B	C NPT / BSPP SAE O-RING	C SAE FLANGE	D	E	F	G	H	J	K	L NPT BSPP	M NPT	M SAE O-RING	M SAE FLANGE	M BSPP	N NPT BSPP
EK-505	7.38	3.5 MAX. WIDTH	3.74	N/A	1.62	2.55 DIA.	2.19	2.59	7.44	2.50	.34 x .62 SLOT	N/A	1/2	#8 3/4-16 UNF-2B	N/A	1/2	3/4
EK-508	10.38		3.90				3.85	3.26	10.44				3/4	#12 1 1/16-12 UN-2B		3/4	
EK-510	12.38						5.85		12.44								
EK-512	14.38						7.85		14.44								
EK-514	16.38						9.85		16.44								
EK-518	20.38						13.85		20.44								
EK-524	26.38						19.85		26.44								
EK-536	38.38						31.85		38.44								
EK-708	11.12	5.0 MAX. WIDTH	5.47	5.71	2.59	3.52 DIA.	3.00	4.07	10.71	3.00	.44 x .75 SLOT	1/4	1 1/2	#24 1 7/8-12 UN-2B	1 1/2	1 1/2	1 1/4
EK-712	15.12						7.00		14.71								
EK-714	17.12						9.00		16.71								
EK-718	21.12						13.00		20.71								
EK-724	27.12						19.00		26.71								
EK-736	39.12						31.00		38.71								
EK-1012	15.33	6.5 MAX. WIDTH	7.64	8.28	4.00	5.05 DIA.	6.18	4.57	15.45	4.00	.44 x 1.00 SLOT		2		2		1 1/2
EK-1014	17.33						8.18		17.45								
EK-1018	21.33						12.18		21.45								
EK-1024	27.33						18.18		27.45								
EK-1036	39.33						30.18		39.45								
EK-1048	51.33						42.18		51.45								

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

Dimensions

Two Pass



Flange Size	1-1/2	2
X	1.41	1.69
Y	2.75	3.06
EKF Z	1/2 - 13 UNC-28	
EKFM Z	M-12	

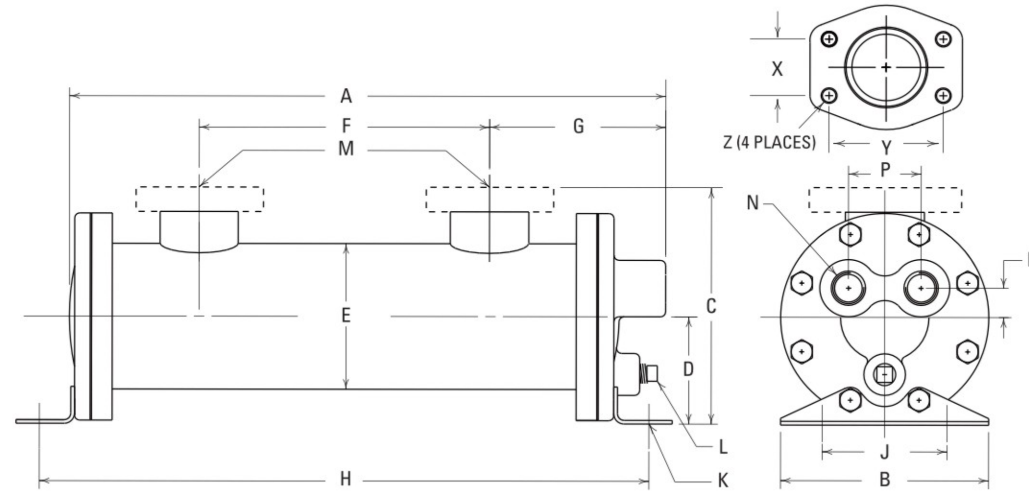
MODEL	A	B	C		D	E	F	G	H	J	K	L	M				N	P
			NPT / BSPP SAE O-RING	SAE FLANGE								NPT BSPP	NPT	SAE O-RING	SAE FLANGE	BSPP	NPT BSPP	
EK-505	7.38	3.5 MAX. WIDTH	3.74	N/A	1.62	2.55 DIA.	2.19	2.59	7.44	2.50	.34 x .62 SLOT	N/A	1/2	#8 3/4-16 UNF-2B	N/A	1/2	3/8	1.12
EK-508	10.38		3.90				3.85	3.26	10.44				3/4	#12 1 1/16-12 UN-2B		3/4		
EK-510	12.38						5.85		12.44									
EK-512	14.38						7.85		14.44									
EK-514	16.38						9.85		16.44									
EK-518	20.38						13.85		20.44									
EK-524	26.38						19.85		26.44									
EK-536	38.38						31.85		38.44									
EK-708	10.19	5.0 MAX. WIDTH	5.47	5.71	2.59	3.52 DIA.	3.00	3.57	10.71	3.00	.44 x .75 SLOT	1/4	1 1/2	#24 1 7/8-12 UN-2B	1 1/2	1 1/2	3/4	1.62
EK-712	14.19						7.00		14.71									
EK-714	16.19						9.00		16.71									
EK-718	20.19						13.00		20.71									
EK-724	26.19						19.00		26.71									
EK-736	39.19						31.00		38.71									
EK-1012	14.58	6.5 MAX. WIDTH	7.64	8.28	4.00	5.05 DIA.	6.18	4.45	15.45	4.00	.44 x 1.00 SLOT		2		2		1.0	2.38
EK-1014	16.58						8.18		17.45									
EK-1018	20.58						12.18		21.45									
EK-1024	26.58						18.18		27.45									
EK-1036	38.58						30.18		39.45									
EK-1048	50.58						42.18		51.45									

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

美國 TTP 油冷却器

Dimensions

Four Pass



Flange Size	1-1/2	2
X	1.41	1.69
Y	2.75	3.06
EKF Z	1/2 - 13 UNC-28	
EKFM Z	M-12	

MODEL	A	B	C		D	E	F	G	H	J	K	L	M				N	P	R
			NPT / BSPP SAE O-RING	SAE FLANGE								NPT BSPP	NPT	SAE O-RING	SAE FLANGE	BSPP	NPT BSPP		
EK-708	10.37	5.0 MAX. WIDTH	5.47	5.71	2.59	3.52 DIA.	3.00	4.25	10.71	3.00	.44 x .75 SLOT	1/4	1 1/2	#24 1 7/8-12 UN-2B	1 1/2	1 1/2	1/2	1.75	.70
EK-712	14.37						7.00		14.71										
EK-714	16.37						9.00		16.71										
EK-718	20.37						13.00		20.71										
EK-724	26.37						19.00		26.71										
EK-736	38.37						31.00		38.71										
EK-1012	14.33	6.5 MAX. WIDTH	7.64	8.28	4.00	5.05 DIA.	6.18	4.45	15.45	4.00	.44 x 1.00 SLOT		2		2		3/4	2.50	.89
EK-1014	16.33						8.18		17.45										
EK-1018	20.33						12.18		21.45										
EK-1024	26.33						18.18		27.45										
EK-1036	38.33						30.18		39.45										
EK-1048	50.33						42.18		51.45										

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

美國 TTP 油冷却器

Selection Procedure 選型步驟

Performance Curves are based on 100SSU oil leaving the cooler 40°F higher than the incoming water temperature (40°F approach temperature).

性能曲綫是根據油離開熱交換器時仍高於進口水溫4.4C°爲冷却目標。

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: $HP = \frac{BTU/Hr}{2545}$

額定熱負荷: 這會根據不同的系統而改變,但通常冷却目標是帶走動力源銘牌上標示的功率或馬力的25~50% (例如: 100Hp馬力單位 x 0.33 = 33Hp的熱負荷)

如果 BTU/Hr. 是已知數: $Hp = \frac{BTU/Hr}{2545}$

Step 2 **Determine Approach Temperature.**

Desired oil leaving cooler °F – Water Inlet temp. °F = Actual Approach

額定冷卻后要達到的油溫度：期望冷卻后的溫度℉ – 進口水溫℉ = 實際降溫幅度

Step 3 **Determine Curve Horsepower Heat Load.** Enter the information from above:

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

釐定熱負荷馬力或功率的曲線。輸入上述資料：

$$\text{HP 熱負荷} \times \frac{40}{\text{實際降溫幅度}} \times \text{油粘度修正 A} = \text{曲線馬力}$$

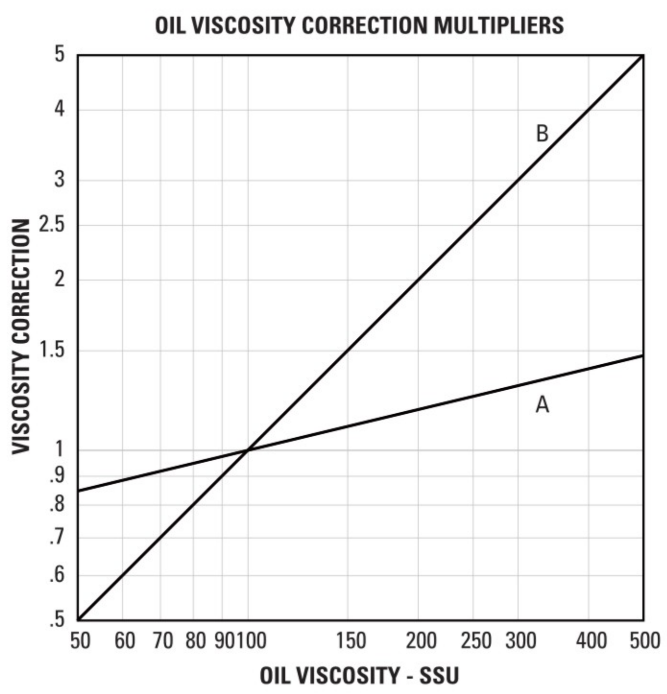
Step 4 **Enter curves** at oil flow through cooler and curve horsepower. Any curve above the intersecting point will work.

輸入馬力曲線和流經冷卻器的油流量於性能曲線圖上，在任何相交點上可找到合適的型號。

Step 5 **Determine Oil Pressure Drop from Curves.** Multiply pressure drop from curve by correction factor B found on oil viscosity correction curve.

從曲線上額定壓力損失

● = 5 PSI; ■ = 10 PSI; ▲ = 20 PSI.



Oil Temperature 油溫

Oil coolers can be selected by using entering or leaving oil tempertures. 油冷卻器可通過進入或離開的油溫來選擇。

Typical operating temperature ranges are: **典型工作溫度範圍是：**

Hydraulic Motor Oil 液壓馬達油	110°F - 130°F
Hydrostatic Drive Oil 靜液壓傳動油	130°F - 180°F
Lube Oil Circuits 潤滑油回路	110°F - 130°F
Automatic Transmission Fluid 自動變速箱油	200°F - 300°F

Desired Reservoir Temperature 期望貯液器溫度

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.

回流管冷卻：期望溫度是離開油冷卻器的油溫。這和貯液器中的溫度是一致的。

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 △T) with this formula:

離線迴圈冷卻回路：期望溫度是進入油冷卻器的溫度。在這種情況下，必須確定油溫變化，以便可以找到實際油離開的溫度。用這個公式來計算油溫變化（油△T）：

Oil △T=(BTU's/Hr.)/GPM Oil Flow x 210).

油△T=（BTU'S/Hr）/（GPM油流量X210）

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

計算從油冷卻器離開的油溫，用下面公式：

Oil Leaving Temperature = Oil Entering Temperature - Oil △T.

油離開溫度=油進入溫度—油△T

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

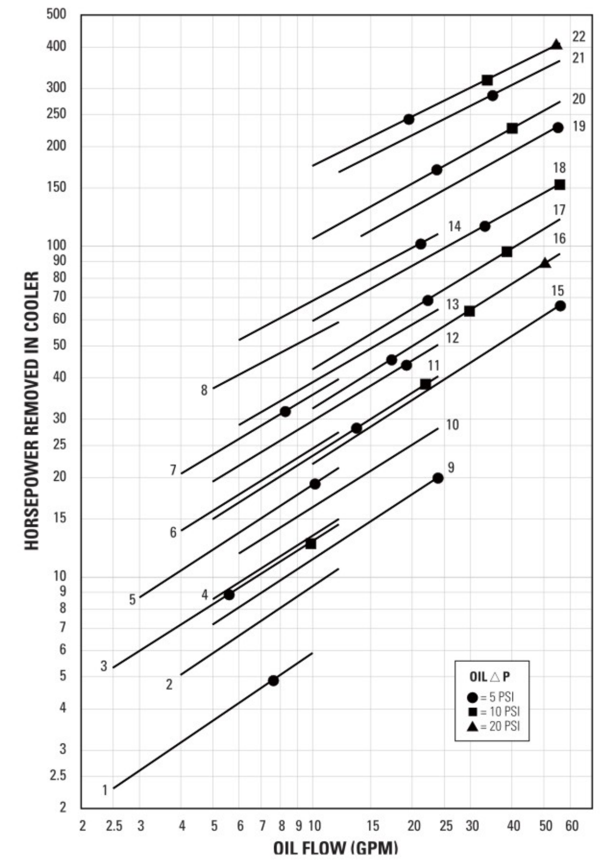
這個公式也可用在任何只有油進入溫度可獲得的應用中。

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.

油壓降：大多數系統可以承受通過熱交換器有20PSI到30PSI的油壓降。過度的壓降應該避免。對於高背壓可能會損壞泵軸封的情況下，應注意將壓降降低到5PSI或更低。

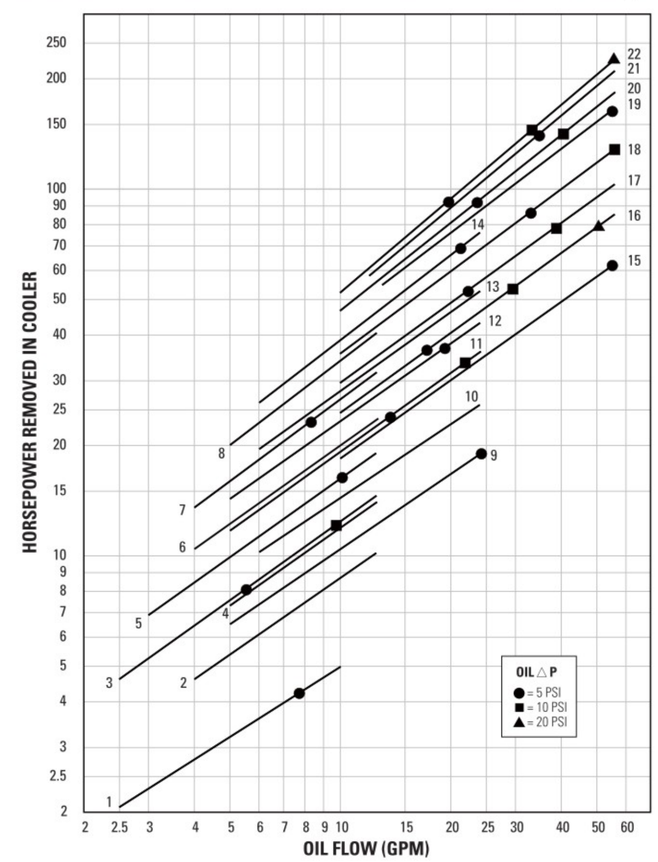
Performance Curves 特性曲綫

1:1 Oil to Water Ratio – High Water Usage 1:1 油水比—高用水量



Models	Net	Weights (lbs) Approx. Shipping
1. EK-505-0	6	7
2. EK-508-0	7	8
3. EK-510-0	8	9
4. EK-512-0	9	10
5. EK-514-0	10	11
6. EK-518-0	11	12
7. EK-524-0	13	14
8. EK-536-0	17	18
9. EK-708-0	15	16
10. EK-712-0	18	19
11. EK-714-0	19	20
12. EK-718-0	22	23
13. EK-724-0	26	28
14. EK-736-0	34	36
15. EK-1012-0	35	37
16. EK-1014-0	38	40
17. EK-1018-0	42	45
18. EK-1024-0	50	55
19. EK-1036-9-0	67	85
20. EK-1036-6-0	67	85
21. EK-1048-8-0	78	95
22. EK-1048-6-0	78	95

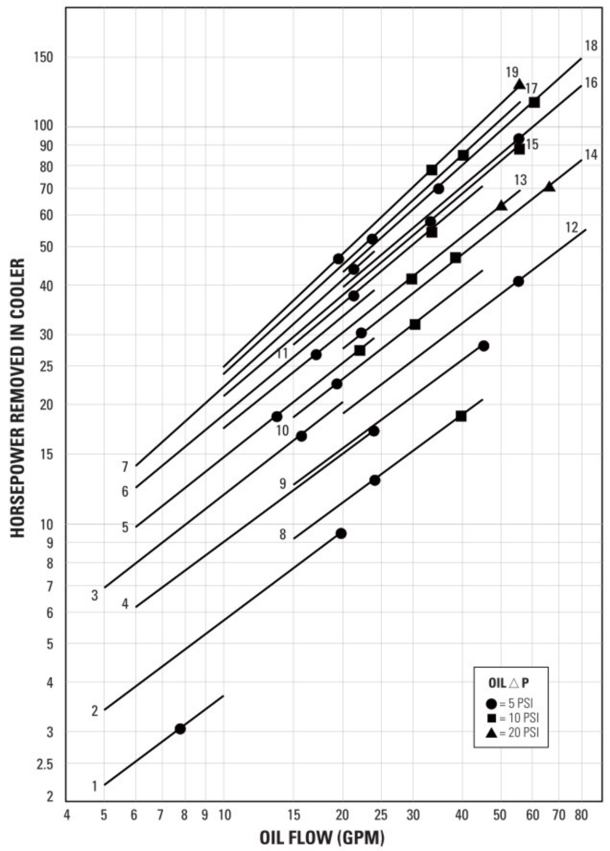
2:1 Oil to Water Ratio – Medium Water Usage 2:1 油水比—中等用水量



Models	Net	Weights (lbs) Approx. Shipping
1. EK-505-T	6	7
2. EK-508-T	7	8
3. EK-510-T	8	9
4. EK-512-T	9	10
5. EK-514-T	10	11
6. EK-518-T	11	12
7. EK-524-T	13	14
8. EK-536-T	17	18
9. EK-708-T	15	16
10. EK-712-T	18	19
11. EK-714-T	19	20
12. EK-718-T	22	23
13. EK-724-T	26	28
14. EK-736-T	34	36
15. EK-1012-T	35	37
16. EK-1014-T	38	40
17. EK-1018-T	42	45
18. EK-1024-T	50	55
19. EK-1036-9-T	67	85
20. EK-1036-6-T	67	85
21. EK-1048-8-T	78	95
22. EK-1048-6-T	78	95

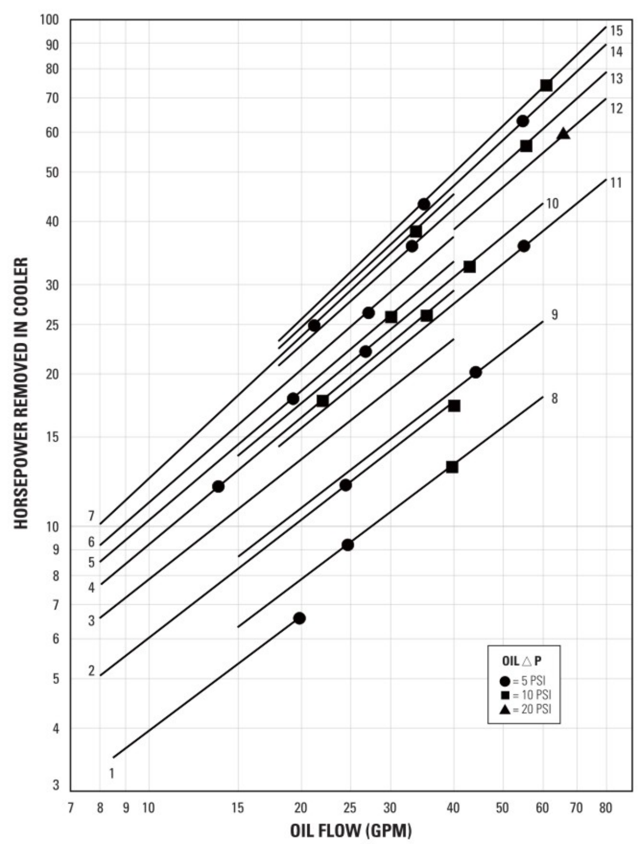
Performance Curves 特性曲綫

4:1 Oil to Water Ratio – Low Water Usage 4:1 油水比—低用水量



Models	Net	Weights (lbs) Approx. Shipping
1. EK-505-T	6	7
2. EK-508-T	7	8
3. EK-518-T	11	12
4. EK-708-F	15	16
5. EK-714-F	19	20
6. EK-724-F	26	28
7. EK-736-F	34	36
8. EK-708-T	15	16
9. EK-712-T	18	19
10. EK-718-T	22	23
11. EK-736-T	34	36
12. EK-1012-T	35	37
13. EK-1014-T	38	40
14. EK-1018-T	42	45
15. EK-1024-T	50	55
16. EK-1036-9-T	67	85
17. EK-1036-6-T	67	85
18. EK-1048-8-T	78	95
19. EK-1048-6-T	78	95

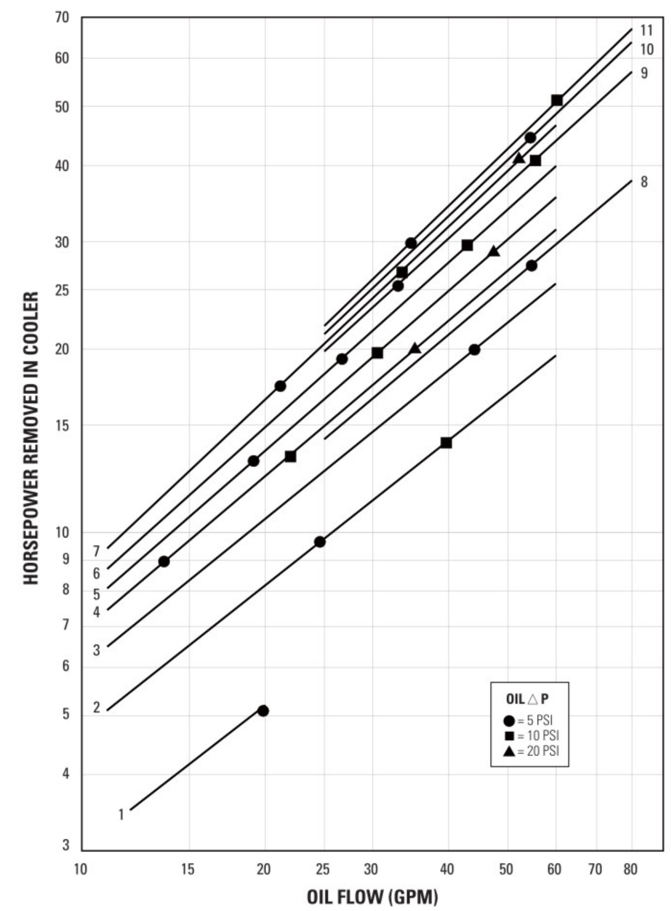
7:1 Oil to Water Ratio – Lower Water Usage 7:1 油水比—更低用水量



Models	Net	Weights (lbs) Approx. Shipping
1. EK-508-T	7	8
2. EK-708-F	15	16
3. EK-712-F	18	19
4. EK-714-F	19	20
5. EK-718-F	22	23
6. EK-124-F	26	28
7. EK-736-F	34	36
8. EK-708-T	15	16
9. EK-712-T	18	19
10. EK-724-T	26	28
11. EK-1012-T	35	37
12. EK-1018-T	42	45
13. EK-1024-T	50	55
14. EK-1036-9-T	67	85
15. EK-1048-8-T	78	95

Performance Curves 特性曲綫

10:1 Oil to Water Ratio – Lowest Water Usage 10:1 油水比—最低用水量



Models	Net	Weights (lbs) Approx. Shipping
1. EK-508-T	7	8
2. EK-708-F	15	16
3. EK-712-F	18	19
4. EK-714-F	19	20
5. EK-718-F	22	23
6. EK-724-F	26	28
7. EK-736-F	34	36
8. EK-1012-F	35	37
9. EK-1014-F	50	55
10. EK-1036-9-F	67	85
11. EK-1048-8-F	78	95

Recirculation Loop 循環回路

Water Cooled Hydraulic Oil Coolers 水冷式液壓油冷卻器

BASIS: 基本原則：

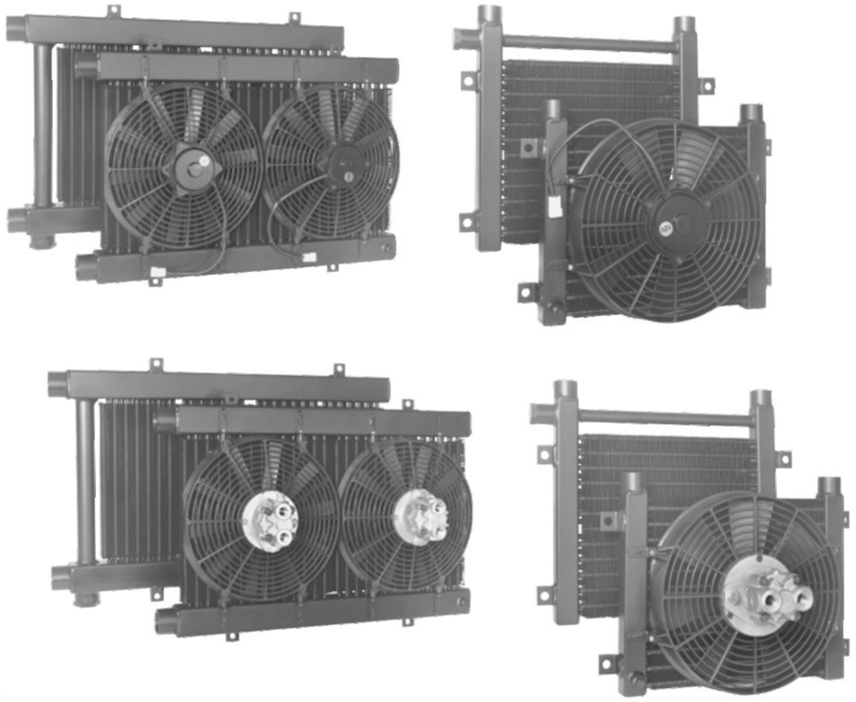
- 40°F Entering temperature difference (Maintain reservoir 40°F above the incoming water temperature)
  40℉進入溫差（保持貯液器40℉以上的進水溫度）
- Heat removal 30% of input horsepower
  熱量移除30%的輸入馬力
- Hydraulic system flow (GPM) x 3 = Gallons; reservoir size
  液壓系統流量（GPM）X3=加侖；貯液器大小
- 1 GPM cooler flow per HP heat to be removed
  1GPM冷卻器流量/HP熱量去除
- Turn-over reservoir 3-4 times per hour
  翻轉貯液器3–4次/小時
- Maximum flows
  最大流量

System Horsepower	HP Heat Load	Minimum Required GPM Oil Flow	Minimum Required GPM Water Flow	Heat Exchanger Model Number
3	.9	1	1	EK-505-T
5	1.5	2		
7.5	2.25			
10	3	3	1.5	EK-512-T
15	4.5	4.5	2	
20	6	6	3	
25	7.5	7.5	4	EK-712-T
30	9	9	4.5	
40	12	12	6	
50	15	15	7.5	EK-1012-T
60	18	18	9	
75	22.5	23	12	
100	30	30	15	

熱交換器 | Mobile MF Series 移動式MF系列

Features 優點

- **Same as M Series with DC Fan or Hydraulic Motor**
  在M系列基礎上加上直流風扇或者液壓馬達
- **3/8″ Tube Size** **3/8"列管**
- **Aluminum Fins** **鋁散熱片**
- **Low AMP Draw 12 or 24 Volt DC Motor**
  低電流供給12或24V直流馬達
- **Heavy Duty Construction** **重載結構**
- **Optional Serviceable Relief Bypass Valve** **備選內置旁通泄壓閥**
- **Optional Fan Control Switch** **備選風扇控制開關**
- **Long Life Hydraulic Motors** **液壓馬達，壽命更長**
- Heat Removal TO 50,000 BTU/Hr.
  能移走熱能達50,000 BTU/小時。
- Oil Flows to 150 GPM 油流量達 150 加侖/分鐘
- Mounting Brackets Included 附固定支架
- SAE, NPT or 37° Flare Oil Connections
  SAE，NPT或37° 彎頭油接口
- Rugged Steel Manifolds 粗壯的鋼結構和油路管道



Ratings 範圍

Operating Pressure 300 psi
工作壓力 21kg/cm²

Operating Temperature 350° F
工作溫度 177C°

Materials 材料

Tubes Copper **列管** 銅
Fins Aluminum **散熱片** 鋁
Turbulators Steel **湍流器** 鋼
Manifolds Steel **油路接口** 鋼
Fan Assembly High Impact Plastic
風扇機構 高抗衝擊塑料
Motor Displacement .22in³/Rev. (Hydraulic)
馬達排量 .22in³/Rev. (Hydraulic)
Maximum Pressure 2000 PSI (Hydraulic)
最大壓力 2000 PSI (Hydraulic)
Allowable Backpressure 1000 PSI (Hydraulic)
允許背壓 1000 PSI (Hydraulic)

Relief Bypass Valve Option 備選內置旁通泄壓閥

MODEL 型號	DESCRIPTION 說明
MFR-15	3/4″, external, all steel valve. Available in either 30 PSI or 60 PSI settings. May be removed for servicing.
MFR-30 MFR-60	1-1/2″, external, all steel valve. Available in either 30 PSI or 60 PSI settings. May be removed for servicing.

Number of Fans	DC current required		Hydraulic Motor Data		
	12 Volt	24 Volt	Oil Flow Required (GPM)	Minimum Operating Pressure (PSI)	Maximum Fan Speed (RPM)
1	12.5 amps	6.3 amps	2.1	300	2200
2	25 amps	12.6 amps	4.2	300	2200

選型指南
How to Order

[ ] – [ ][ ] – [ ] – [ ] – [ ]

系列
Model Series
MF
MFR - Relief Bypass Included

規格
Model Size Selected

接口類型
Connection Type*
1 - NPT
2 - SAE
3 - BSPP
7 - 37° Male Flare

馬達型式
Motor Specification
NM - No Motor 不帶馬達
4A - 12 Volt DC 12V馬達
4B - 24 Volt DC 24V馬達
9 - Hydraulic Motor 油馬達

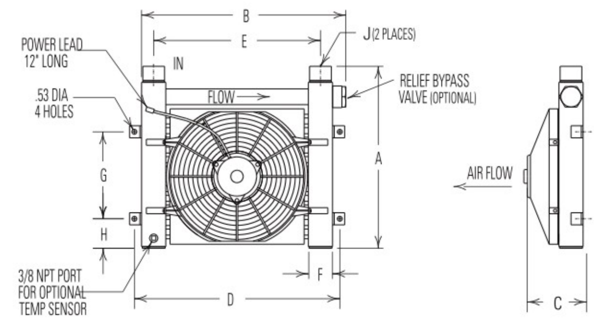
旁通壓力設定
Relief Bypass
Blank - No Bypass
30 - 30 psi
60 - 60 psi
ADD FOR MFR MODELS ONLY

*Other connection types available. Please consult factory for assistance.

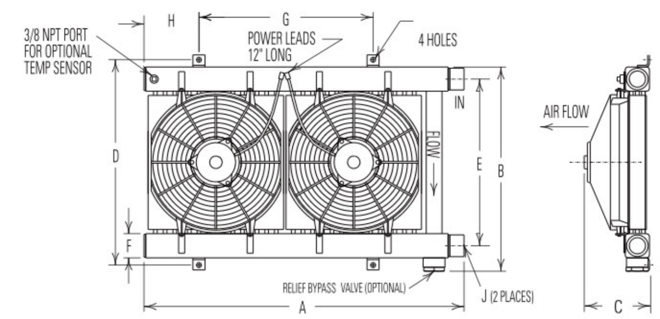
TTPSales@thermasys.com 262.554.8330 www.thermaltransfer.com

Dimensions - 12 & 24 Volt DC Motors

Models MF-15 and MF-30



Model MF-60



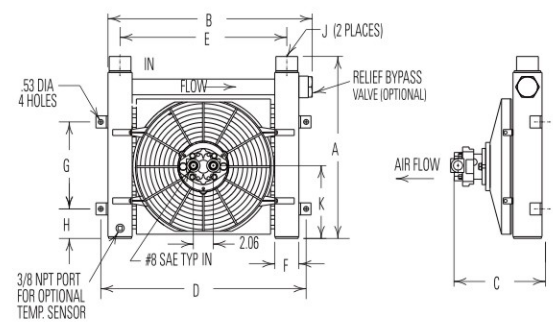
Units shown with optional bypass valve

MODEL	A		B		C	D	E	F	G	H	J		SHIPPING WEIGHT
	MF	MFR	MF	MFR							NPT	SAE	
MF-15	13.88	15.88	15.75	17.41	4.99	17.25	14.25	1.50 SQ	9.00	1.88	1.00	#16	27
MF-30	16.58	18.83	19.75	21.12	6.10	21.25	17.25	2.50 SQ		3.06	1.50	#24	41
MF-60	30.83	33.08							18.00	5.68			78

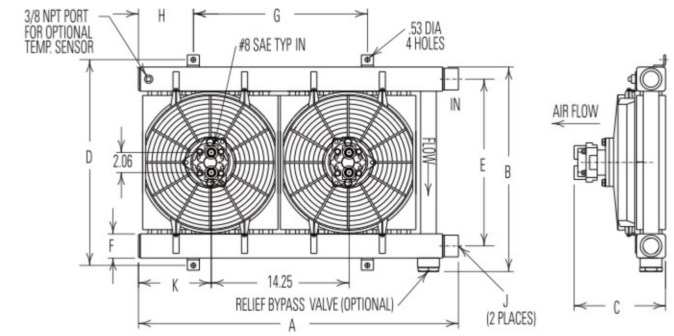
*Note: All dimensions are in inches. We reserve the right to make reasonable design changes without notice. *Inlet and outlet oil connections can be reversed when the bypass valve is not used.*
注意：所有尺寸均為英寸。我們保留在不通知的情況下進行合理設計更改的權利。*當不使用旁通閥時，進口和出口油接口可以反向。

Dimensions - Hydraulic Motors

Models MF-15 and MF-30



Model MF-60

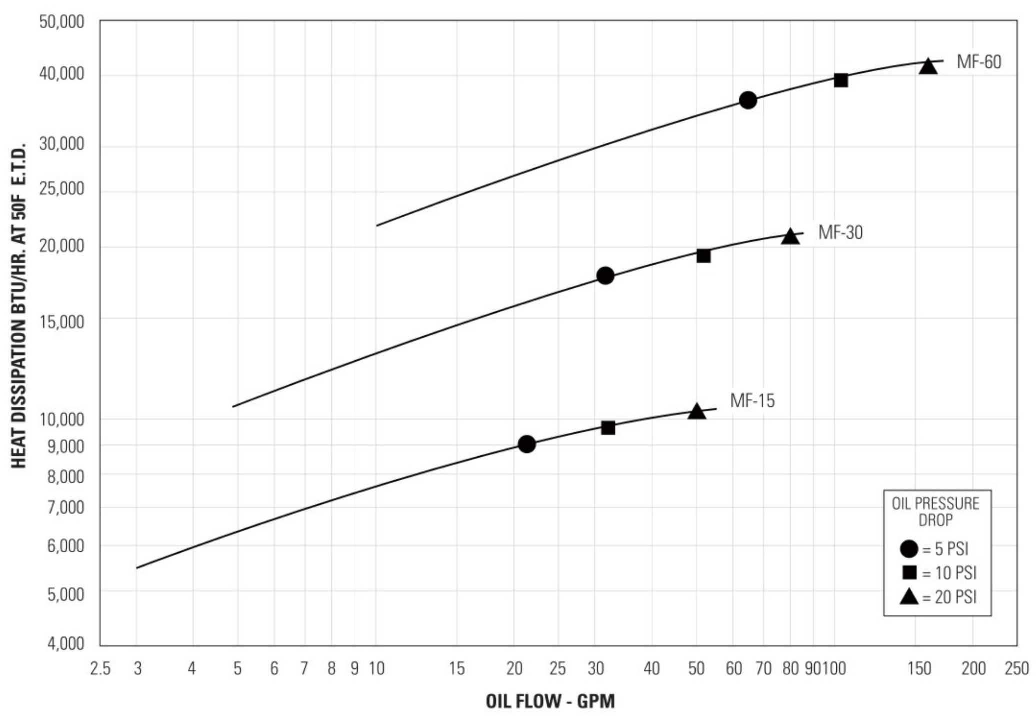


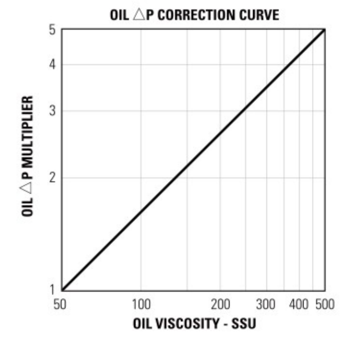
Units shown with optional bypass valve

MODEL	A		B		C	D	E	F	G	H	J		SHIPPING WEIGHT
	MF	MFR	MF	MFR							NPT	SAE	
MF-15	13.88	15.88	15.75	17.41	7.87	17.25	14.25	1.50 SQ	9.00	1.88	1.00	#16	27
MF-30	16.58	18.83	19.75	21.12	8.96	21.25	17.25	2.50 SQ		3.06	1.50	#24	41
MF-60	30.83	33.08							18.00	5.68			78

*Note: All dimensions are in inches. We reserve the right to make reasonable design changes without notice. *Inlet and outlet oil connections can be reversed when the bypass valve is not used.*
注意：所有尺寸均為英寸。我們保留在不通知的情況下進行合理設計更改的權利。*當不使用旁通閥時，進口和出口油接口可以反向。

Performance Curves 特性曲綫





Selection Procedure 選型步驟

Performance Curves are based on 50 SSU oil entering the cooler 50°F higher than the ambient air temperature used for cooling. This is referred to as a 50°F E.T.D.
特性曲線是基於50SSU，油進入冷卻器比用於冷卻的空氣溫度高50℉，這被稱為50℉ E.T.D。

Step 1 **Determine the Heat Load.** Heat load may be expressed as either horsepower or BTU/Hr. To convert horsepower to BTU/Hr.:
BTU/HR = Horsepower x 2545

步驟1 確定熱負載。熱負載可能用馬力或BTU/Hr來表示，把馬力轉變為BTU/Hr：BTU/Hr=馬力X2545

Step 2 **Determine Entering Temperature Difference.** The entering oil temperature is generally the maximum desired oil temperature.
Entering oil temperature – Ambient air temperature = E.T.D.

步驟2 確定進入溫差。進入油溫一般是最大期望進入油溫。
進入油溫—環境空氣溫度=E.T.D

Step 3 **Determine the Corrected Heat Dissipation to use the curves.**

Corrected Heat Dissipation = BTU/HR heat load x $\frac{50°F \times Cv}{E.T.D.}$

步驟3 確定修正散熱量以用來使用曲線。
修正散熱量=BTU/Hr熱負載X（50℉xCv/E.T.D）

Step 4 **Enter curves** at oil flow through cooler and curve heat dissipation. Any curve above the intersecting point will work.

步驟4 輸入通過冷卻器的油流量和散熱量在曲線上。在任何相交點以上的曲線都可以正常工作。

Step 5 **Determine Oil Pressure Drop from Curves:**
● = 5 PSI; ■ = 10 PSI; ▲ = 20 PSI. Multiply pressure drop from curve by correction factor found in oil ▲ P correction curve.

步驟5 從曲線上確定油壓降：
●=5PSI; ■=10PSI; ▲=20PSI. 從油▲P修正曲線上發現的修正因數乘以來自曲線的壓降。

Oil Temperature 油温

Typical operating temperature ranges are:
典型工作溫度範圍是：

Hydraulic Motor Oil 液壓馬達油	120°F - 180°F
Hydrostatic Drive Oil 靜液壓傳動油	160°F - 180°F
Engine Lube Oil 潤滑油回路	180°F - 200°F
Automatic Transmission Fluid 自動變速箱油	200°F - 300°F

C_V Viscosity Correction

	OIL				
Average Oil Temp °F	**SAE 5** 110 SSU at 100°F 40 SSU at 210°F	**SAE 10** 150 SSU at 100°F 43 SSU at 210°F	**SAE 20** 275 SSU at 100°F 50 SSU at 210°F	**SAE 30** 500 SSU at 100°F 65 SSU at 210°F	**SAE 40** 750 SSU at 100°F 75 SSU at 210°F
100	1.14	1.22	1.35	1.58	1.77
150	1.01	1.05	1.11	1.21	1.31
200	.99	1.00	1.01	1.08	1.10
250	.95	.98	.99	1.00	1.00

Thermostatic Temperature Control Option (DC)

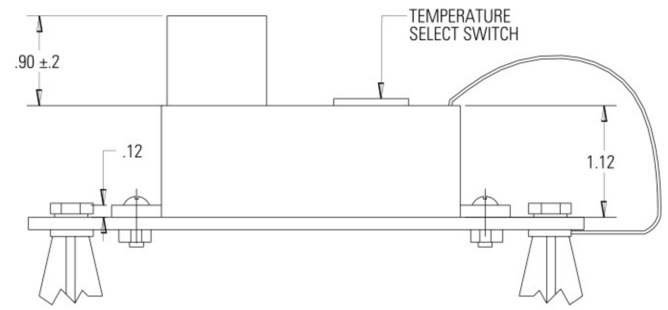
恒溫溫度控制選項（DC）

This controller was designed to mount on the cooler without requiring extensive wiring or plumbing. It provides accurate temperature control by cycling the cooling fan(s) to maintain desired oil temperature.
這個控制器的設計安裝在冷卻器上，而不需要大量佈線或管道。它通過循環冷卻風扇來精確控制溫度，用來保持期望的油溫。

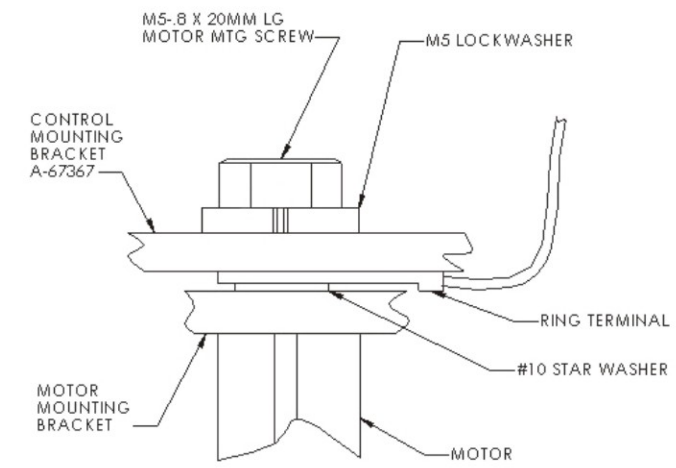
- 12 or 24 volt operation 12或24V操作
- Adjustable temperature settings range from 100°F thru 210°F in 20°F increments
  調整溫度設置範圍為100℉到210℉，增量為20℉
- For use with one or two fan models 用於一個或兩個風扇型號
- Temperature sensor provided 提供溫度感測器
- Wiring provided for remote manual override 為遠端手動覆蓋提供佈線
- Mounting hardware included 包括安裝硬體

Part Number	Description
96171	Electronic Fan Control Kit
68790	Replacement Control Only
67699	Replacement Sensor Only

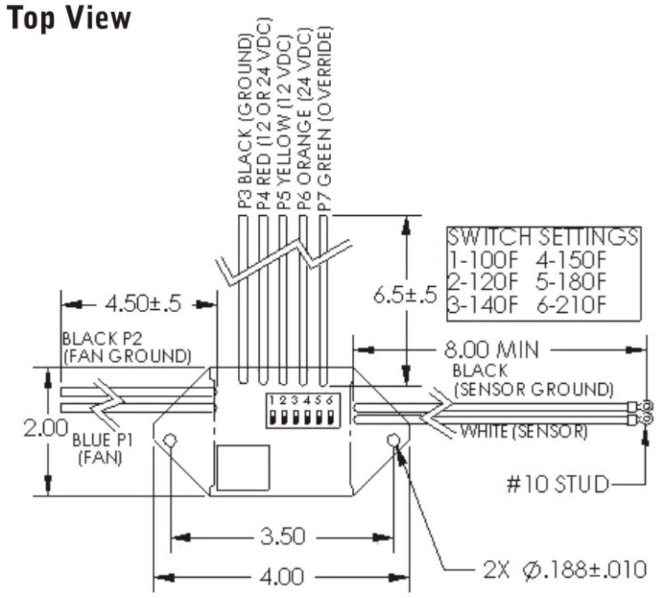
Side View



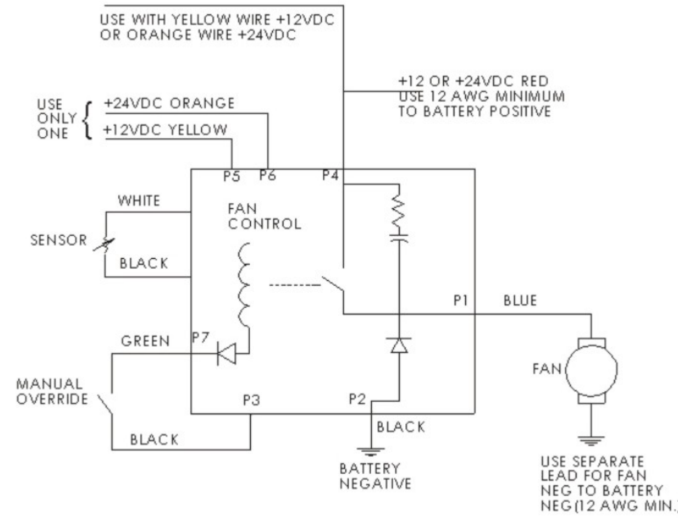
Connection Assembly



Top View



Electrical Schematic



NOTE: This switch should be fused to prevent damage if ground is lost. A 30 amp fuse is required in the power supply.
注意：如果接地線失效，此開關應熔斷以防止損壞，電源供應需一個30A的保險絲。