

# Hydraulic Oil Coolers

## INTRODUCTION

These oil coolers are also suitable for heat transfer fluids, lubricating and quenching oils. They are high-quality products incorporating the best materials and the latest technical features. The tube stack is fully floating, so that thermal stresses are minimised and it can be easily removed, should cleaning be necessary.

## SELECTION

We have listed on page 7 some typical examples of oil cooler performance. This information is only intended to provide a general basis for selection. Graphs are available which show how heat dissipation and pressure losses vary with oil and water flow. Alternatively, we can select by computer, the size of oil cooler required from the following information:

- Oil type or its viscosity at a specified temperature cSt at °C
- Oil flow l/min
- Required oil outlet temperature °C
- Heat to be dissipated kW
- Temperature of cooling water °C

## INSTALLATION

The oil coolers should be mounted as shown below to ensure that they operate full of water and should be connected for counterflow. If the water control valve is used, it should be of the modulating type and fitted on the inlet side, so that the cooler is not unnecessarily pressurised with water when the system is shut down. Care must be taken not to exceed the recommended water flow rates and the pH of the water should be between 7.2 and 7.8. For hydraulic applications, the oil cooler should be in the return pipe to tank as shown in the diagram, but on installations where this is subject to violent fluctuations in flow and pressure, it may be advisable to connect the cooler into a separate circuit with its own pump. It is good practice for the oil pressure in the cooler to be higher than the water pressure, so that should a leak occur, the oil will not be contaminated with water.

## MARINE

The stainless steel shell and head are satisfactory with fresh water. For use with contaminated fresh water or sea water, we can, at extra cost, supply stainless steel 316L construction for tubes and heads and high anti-corrosive titanium material for tubes and heads.

## 150°C OIL

We can supply coolers suitable for oil temperatures of up to 150°C. For this application, we use thicker material for shell and tubesheet.

## 200°C OIL

In addition, we have a limited range of oil coolers suitable for use with oil or heat transfer fluids up to 200°C. These oil coolers have a cast iron shell, viton seals and a special tube stack.



## MINING

We have various range of oil coolers suitable for underground mining applications and water pressures up to 35 bar.

Alfa Biz Limited || Subsidiary factory: Linan Beta Mechanical & Electrical Co., Ltd.  
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## GENERAL

Please contact us for applications not covered by our published information. We can also advise on the best method of installing coolers, particularly for unusual or critical applications. If a single unit is too small, multiple units can be connected either in series or in parallel according to the oil flow rate. We can also supply the PK range of coolers with 4" ports and special high flow tube stacks suitable for oil flow rates up to 1400 l/min.

### Performance data of hydraulic oil coolers

Cooler Type	Maximum oil flow	Maximum sea water flow	Maximum fresh water flow	Internal oil volume	Internal water volume
	Liter/min	Liter/min	Liter/min	Liter	Liter
EC 80-H	100	54	80	0.26	0.31
EC100-H	110	54	80	0.49	0.44
EC120-H	90	54	80	0.74	0.57
EC140-H	80	54	80	0.97	0.71
EC160-H	70	54	80	1.30	0.91
FC 80-H	140	95	140	0.75	0.65
FC100-H	130	95	140	1.10	0.84
FC120-H	110	95	140	1.50	1.06
FC140-H	100	95	140	2.00	1.35
FC160-H	90	95	140	2.60	1.68
FG 80-H	230	125	190	1.64	1.26
FG100-H	210	125	190	2.40	1.56
FG120-H	190	125	190	3.00	1.96
FG140-H	170	125	190	3.90	2.42
FG160-H	150	125	190	5.00	2.97
FG200-H	130	125	190	7.58	4.53
GL140-H	330	225	330	3.60	3.10
GL180-H	290	225	330	4.80	3.80
GL240-H	280	225	330	6.30	4.60
GL320-H	260	225	330	8.00	5.50
GL400-H	260	225	330	10.00	6.60
GL480-H	240	225	330	12.20	7.70
JK190-H	780	460	700	9.70	8.80
JK250-H	740	460	700	12.50	10.40
JK320-H	690	460	700	16.10	12.50
JK400-H	660	460	700	20.30	14.70
JK480-H	620	460	700	24.20	17.10
JK600-H	560	460	700	30.70	20.40
PK190-H	1200	700	1050	13.60	16.00
PK250-H	1100	700	1050	17.70	18.60
PK320-H	1050	700	1050	22.60	21.80
PK400-H	1000	700	1050	28.50	25.30
PK480-H	960	700	1050	34.00	29.00
PK600-H	900	700	1050	42.50	34.40

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**Note:**

Maximum permitted oil flow based on Shell Tellus 37 at 60C

Exceeding the maximum permitted water flow may cause tube failure.

Typical examples of oil cooler performance with an oil outlet temperature of 50C and a water inlet temperature of 25C

Cooler Type	Heat dissipated	Oil flow	Oil pressure drop	Water flow	Head loss
	kW	Liter/min	kPa	Liter	kPa
EC 80-H	4	80	100	80	50
EC100-H	9	92		80	
EC120-H	13	77		77	
EC140-H	17	68		72	
EC160-H	22	64		66	
FC 80-H	13	140	100	140	50
FC100-H	19	145		135	
FC120-H	26	116		125	
FC140-H	35	105		120	
FC160-H	45	96		108	
FG 80-H	28	192	100	185	50
FG100-H	37	190		175	
FG120-H	50	160		160	
FG140-H	62	160		150	
FG160-H	79	145		135	
FG200-H	123	130		120	
GK190-H	112	460	100	420	50
GK250-H	144	445		385	
GK320-H	181	430		355	
GK400-H	221	420		325	
GK480-H	259	400		300	
GK600-H	329	365		275	
JK190-H	145	830	100	600	50
JK250-H	186	740		550	
JK320-H	232	690		500	
JK400-H	283	650		460	
JK480-H	335	620		430	
JK600-H	401	600		400	
PK190-H	212	1600	100	900	50
PK250-H	270	1240		840	
PK320-H	336	1060		750	
PK400-H	414	950		700	
PK480-H	497	890		650	
PK600-H	660	750		600	

## Design Parameter:

Maximum working pressure on oil side: 20bar, 25bar, 35 bar

Maximum working pressure on water side: 20 bar, 25 bar, 35 bar

Design temperature: 120°C, 150°C, 200°C,

We produce customized applications on different working pressure and temperature.

## Specification and dimension of oil coolers

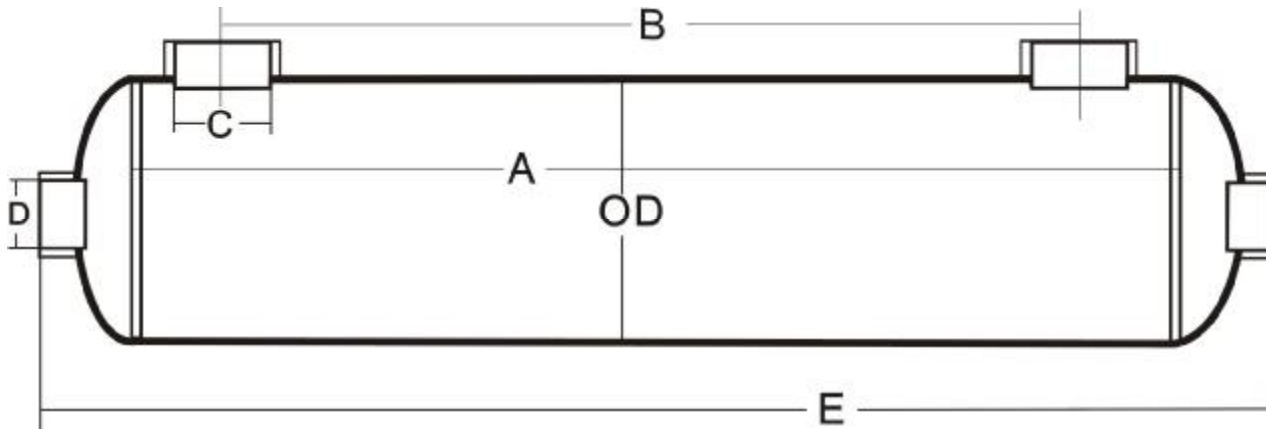
Model	A(mm)	B(mm)	C(BSP)	D(BSP)	E(mm)	Note
EC 80-H	100	70	1/2"	3/4"	200	OD89mm,bolt M8 X 100 X76mm
EC100-H	196	156	3/4"	3/4"	296	
EC120-H	286	246	3/4"	3/4"	386	
EC140-H	396	356	3/4"	3/4"	496	
EC160-H	536	496	3/4"	3/4"	636	
FC 80-H	196	152	1"	1"	296	OD108mm,bolt M8 X 100X 76mm
FC100-H	286	242	1"	1"	386	
FC120-H	396	352	1"	1"	496	
FC140-H	536	492	1"	1"	636	
FC160-H	896	842	1"	1"	1036	
FG 80-H	286	232	1 1/4"	1 1/4"	426	OD133mm,bolt M8 X 100 X 76mm
FG100-H	396	342	1 1/4"	1 1/4"	536	
FG120-H	536	482	1 1/4"	1 1/4"	676	
FG140-H	696	642	1 1/4"	1 1/4"	836	
FG160-H	896	842	1 1/4"	1 1/4"	1026	
FG200-H	1340	1286	1 1/4"	1 1/4"	1480	
GL140-H	396	332	1 1/2"	1 1/2"	536	OD159mm,bolt M12X100X150mm
GL180-H	536	472	1 1/2"	1 1/2"	676	
GL240-H	696	632	1 1/2"	1 1/2"	836	
GL320-H	896	832	1 1/2"	1 1/2"	1036	
GL400-H	1116	1052	1 1/2"	1 1/2"	1256	
GL480-H	1340	1276	1 1/2"	1 1/2"	1480	
GK190-H	486	410	2"	2"	626	OD200mm,bolt M12X100X150mm
GK250-H	646	570	2"	2"	786	
GK320-H	836	760	2"	2"	976	
GK400-H	1056	980	2"	2"	1196	
GK480-H	1276	1200	2"	2"	1416	
GK600-H	1606	1530	2"	2"	1746	
JK190-H	486	388	2 1/2"	2 1/2"	626	OD230mm,bolt M12X100X150mm
JK250-H	646	548	2 1/2"	2 1/2"	786	
JK320-H	836	738	2 1/2"	2 1/2"	976	
JK400-H	1056	958	2 1/2"	2 1/2"	1196	
JK480-H	1276	1178	2 1/2"	2 1/2"	1416	
JK600-H	1606	1508	2 1/2"	2 1/2"	1746	

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Model	A(mm)	B(mm)	C(BSP)	D(BSP)	E(mm)	Note
PK190-H	486	370	3"	3"	636	OD273mm, Bolts M12 X 100X150
PK250-H	646	530	3"	3"	796	
PK320-H	836	720	3"	3"	986	
PK400-H	1056	940	3"	3"	1206	
PK480-H	1276	1160	3"	3"	1426	
PK600-H	1606	1490	3"	3"	1756	



## Operation and Maintenance of Coolers

No oil cooler manufacturer can guarantee that his products will have an indefinite life and for this reason, we suggest that the cooling system is designed to minimise any damage caused by a leaking oil cooler.

This can be achieved as follows:

1. The oil pressure should be higher than the sea water pressure, so that in the event of a leak occurring, the oil will not be contaminated.
2. When the hydraulic system is not being used, the coolers should be isolated from sea water pressure.
3. The sea water outlet pipe from the cooler should have a free run to waste.
4. Stainless steel sea water pipes and fittings should not be used adjacent to the oil cooler.
5. Ensure maximum stated flow rates are not exceeded.