HYDRAULIC OIL COOLERS

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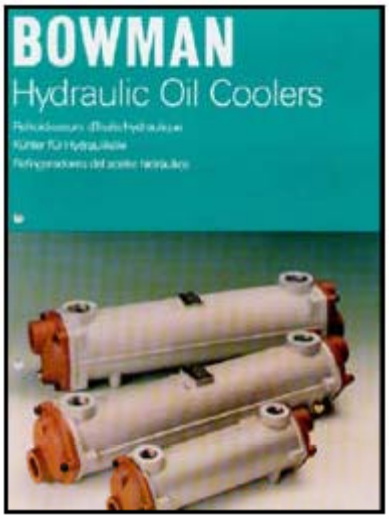


INTRODUCTION

These oil coolers are also suitable for heat transfer fluids, lubricating, transformer & 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

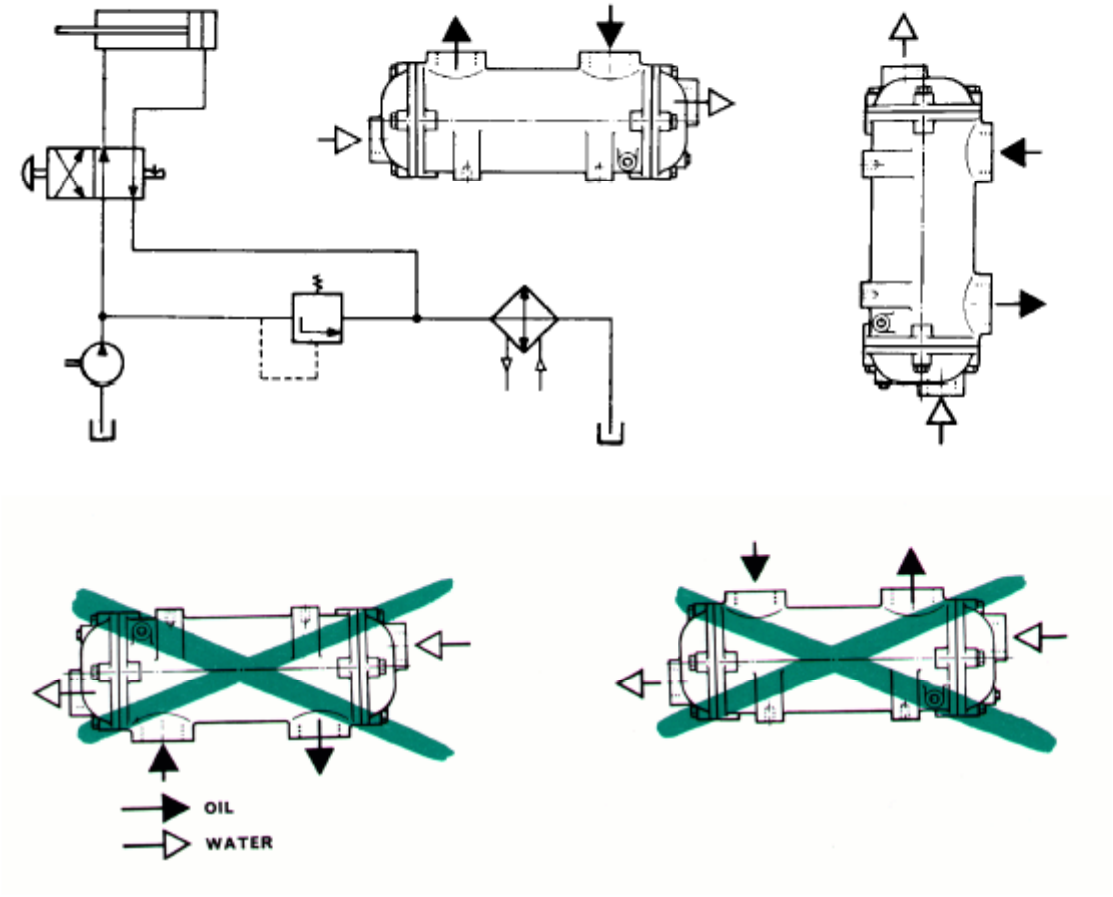
Listed in TABLE 1 are typical examples of oil cooler performance. This information is only intended to provide a general basis for selection, graphs are available (on request) which show how heat dissipation and pressure losses vary with oil and water flow. Alternatively we can select by computer, the 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 counter flow. If a 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 usually be in the return pipe to the tank as shown in Diagram 1, 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.

DIAGRAM 1



SEALS

The standard seal material is nitrile. We can, at extra cost, supply seals compatible with the various fire resistant fluids. To specify these seals a suffix should be added to the oil cooler type number as follows :- EP (Ethylene Propylene), VT (Viton). When ordering replacement seals, change the suffix NT in the seals part number as required.

MARINE

The standard cast iron end covers are satisfactory with fresh-water. For use with contaminated fresh-water or sea water, we can, at extra cost, supply bronze end covers. To specify this material, change the 4 figure section of the type number as follows :-

1425 to 3875, 1426 to 3876, 1427 to 3877, 1428 to 3878,
1658 to 3879, 1661 to 3881, 1669 to 3880.

150° C OIL

We can supply coolers suitable for oil temperatures of up to 150°C. To specify for this service, change the 4 figure section of the type number as follows :-

1425 to 3145 1426 to 3146 1427 to 3147 1428 to 3148
1658 to 3149 1661 to 3152 1669 to 3150

200ºC OIL

In addition, we have a limited range of oil coolers suitable for use with oil or heat transfer fluids up to 200ºC. These oil coolers have a cast iron shell, viton seals and a special tube stack. To specify for this service, change the 4 figure section of the type number to the following :-

1425 to 3635 1426 to 3636 1427 to 3637 1428 to 3638

This particular option is only available with coolers marked ⇘ in the "Type" column in TABLE 2 below.

MINING

We have a limited range of oil coolers suitable for underground mining applications and water pressures up to 35 bar. These oil coolers have a cast iron shell, viton seals and a special tube stack with cupro-nickel tube. To specify for this service, change the 4 figure section of the type number as follows :-

1425 to 3425 1426 to 3426 1427 to 3427 1428 to 3428

This option is only available with coolers marked ⇘ in the "Type" column in TABLE 2 below.

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.

TABLE 1 - Useful information

Type	* Maximum oil flow	Maximum sea water flow	Maximum fresh water flow	Internal oil volume	Internal water volume
	litre/min	litre/min	litre/min	litre	litre
EC 80-1425-1	100	30	50	0.26	0.31
EC100-1425-2	110	..	..	0.49	0.44
EC120-1425-3	90	..	..	0.74	0.57
EC140-1425-4	80	..	..	0.97	0.71
EC160-1425-5	70	..	..	1.30	0.91
FC 80-1426-1	140	50	85	0.75	0.65
FC100-1426-2	130	..	..	1.10	0.84
FC120-1426-3	110	..	..	1.50	1.06
FC140-1426-4	100	..	..	2.00	1.35
FC160-1426-5	90	..	..	2.60	1.68
FG 80-1427-1	230	90	140	1.64	1.26
FG100-1427-2	210	..	..	2.40	1.56
FG120-1427-3	190	..	..	3.00	1.96
FG140-1427-4	170	..	..	3.90	2.42
FG160-1427-5	150	..	..	5.00	2.97
GL140-1428-2	330	120	200	3.60	3.10
GL180-1428-3	290	..	..	4.80	3.80
GL240-1428-4	280	..	..	6.30	4.60
GL320-1428-5	260	..	..	8.00	5.50
GL400-1428-6	260	..	..	10.00	6.60
GL480-1428-7	240	..	..	12.20	7.70
GK190-1658-3	500	220	350	7.00	6.30
GK250-1658-4	470	..	..	9.00	7.50
GK320-1658-5	440	..	..	11.60	9.00
GK400-1658-6	420	..	..	14.60	10.60
GK480-1658-7	400	..	..	17.40	12.30
GK600-1658-8	360	..	..	22.10	14.70
JK190-1661-3	780	340	550	9.70	8.80
JK250-1661-4	740	..	..	12.50	10.40
JK320-1661-5	690	..	..	16.10	12.50
JK400-1661-6	660	..	..	20.30	14.70
JK480-1661-7	620	..	..	24.20	17.10
JK600-1661-8	560	..	..	30.70	20.40
PK190-1669-3	1200	500	800	13.60	16.00
PK250-1669-4	1100	..	..	17.70	18.60
PK320-1669-5	1050	..	..	22.60	21.80
PK400-1669-6	1000	..	..	28.50	25.30
PK480-1669-7	960	..	..	34.00	29.00
PK600-1669-8	900	..	..	42.50	34.40

*Maximum permitted oil flow based on Shell Tellus 37 at 60°C.
Exceeding the maximum permitted water flow may cause tube failure.

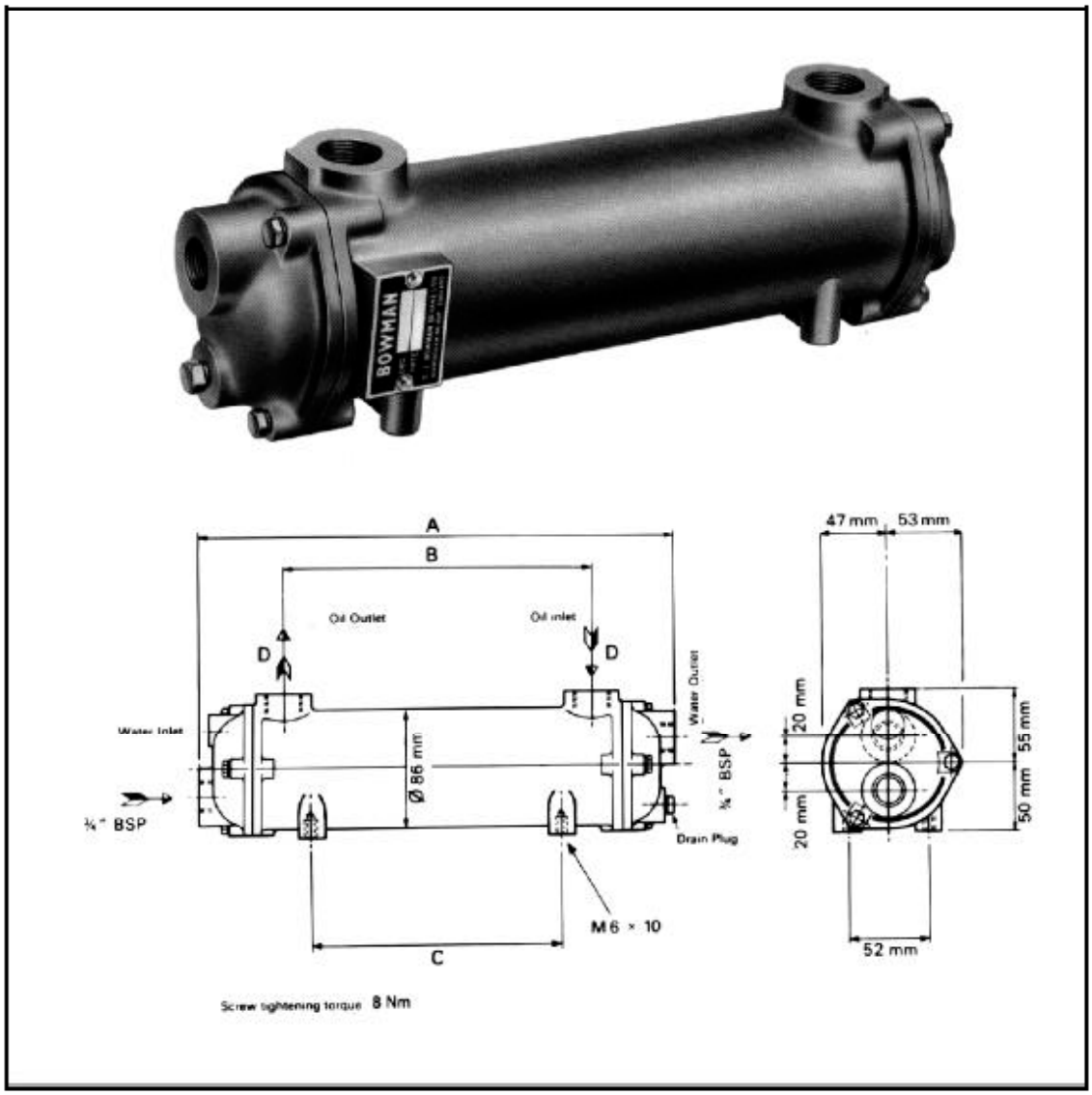
TABLE 2 - Typical examples of oil cooler performance with an oil outlet temperature of 50°C and a water inlet temperature of 25°C.

Type	Heat dissipated	Oil flow	Oil pressure drop	Water flow	Head loss
	Kw	litre/min	kPa	litre/min	kPa
EC 80-1425-1	3	30	10	15	2
★EC100-1425-2	6	46	19	23	5
★EC120-1425-3	9	56	36	28	9
★EC140-1425-4	13	64	60	32	13
★EC160-1425-5	16	56	56	28	12
FC 80-1426-1	8	66	16	33	2
★FC100-1426-2	12	80	32	40	3
★FC120-1426-3	18	104	96	52	7
FC140-1426-4	25	106	100	53	11
★FC160-1426-5	29	98	104	49	14
FG 80-1427-1	16	100	28	50	4
★FG100-1427-2	26	120	55	60	7
FG120-1427-3	36	140	74	70	13
FG140-1427-4	48	160	106	80	17
★FG160-1427-5	56	140	95	70	16
★GL140-1428-2	40	180	40	90	7
GL180-1428-3	52	200	55	100	9
GL240-1428-4	66	220	62	110	12
GL320-1428-5	84	240	80	120	16
★GL400-1428-6	108	260	100	130	19
GL480-1428-7	120	240	96	120	21
GK190-1658-3	76	320	44	160	9
GK250-1658-4	106	360	64	180	13
GK320-1658-5	134	400	90	200	20
★GK400-1658-6	175	420	110	210	25
GK480-1658-7	205	400	115	200	28
GK600-1658-8	240	360	110	180	28
JK190-1661-3	108	450	44	230	10
JK250-1661-4	150	510	64	260	14
JK320-1661-5	190	570	90	280	19
JK400-1661-6	248	600	110	300	25
JK480-1661-7	290	570	115	280	29
JK600-1661-8	340	510	110	260	28
PK190-1669-3	133	720	36	340	9
PK250-1669-4	180	780	50	390	13
PK320-1669-5	250	840	62	420	17
PK400-1669-6	325	900	76	450	25
PK480-1669-7	410	960	100	480	32
PK600-1669-8	500	900	116	450	32

1Kw = 14,4 kcal/min = 60 kJ/min = 1,34 HP 100kPa = 1 bar

★ **DESPATCH 10 DAYS FROM RECEIPT OF WRITTEN ORDER**

EC RANGE



		A	B	C	D
	kg	mm	mm	mm	BSP
EC 80-1425-1	2.4	174	60	60	½"
EC100-1425-2	3.2	260	140	104	¾"
EC120-1425-3	3.8	346	226	190	¾"
EC140-1425-4	4.8	444	324	288	¾"
EC160-1425-5	5.7	572	452	416	¾"

Maximum working oil pressure	20 bar
Maximum working water pressure	20 bar
Maximum working temperature	120°C

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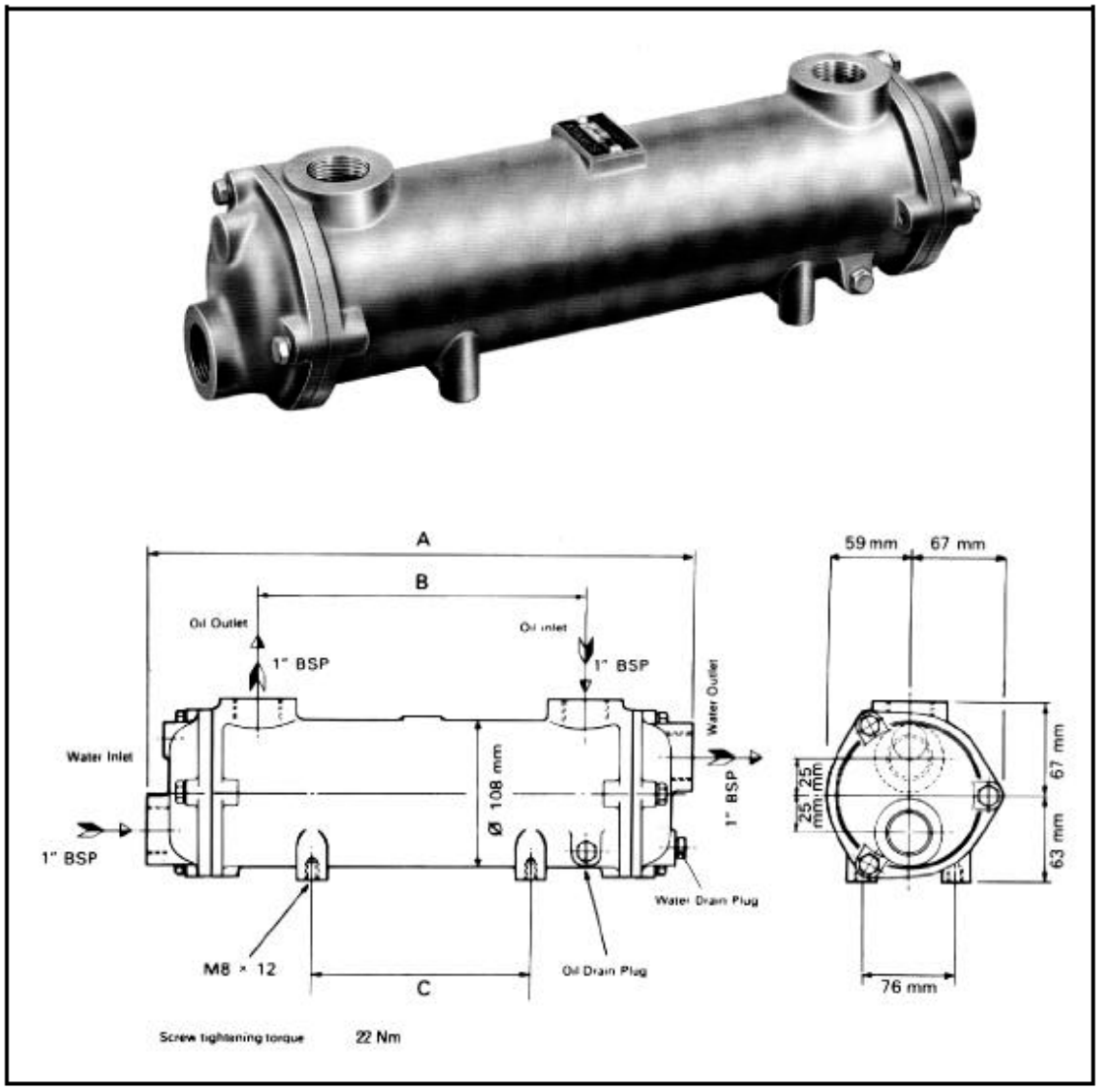

		A	B	C
	kg	mm	mm	mm
FC 80-1426-1	5.5	272	116	104
FC100-1426-2	6.3	358	202	190
FC120-1426-3	7.3	456	300	288
FC140-1426-4	9.4	584	428	288
FC160-1426-5	11.0	730	574	434

Maximum working oil pressure	20 bar
Maximum working water pressure	20 bar
Maximum working temperature	120°C

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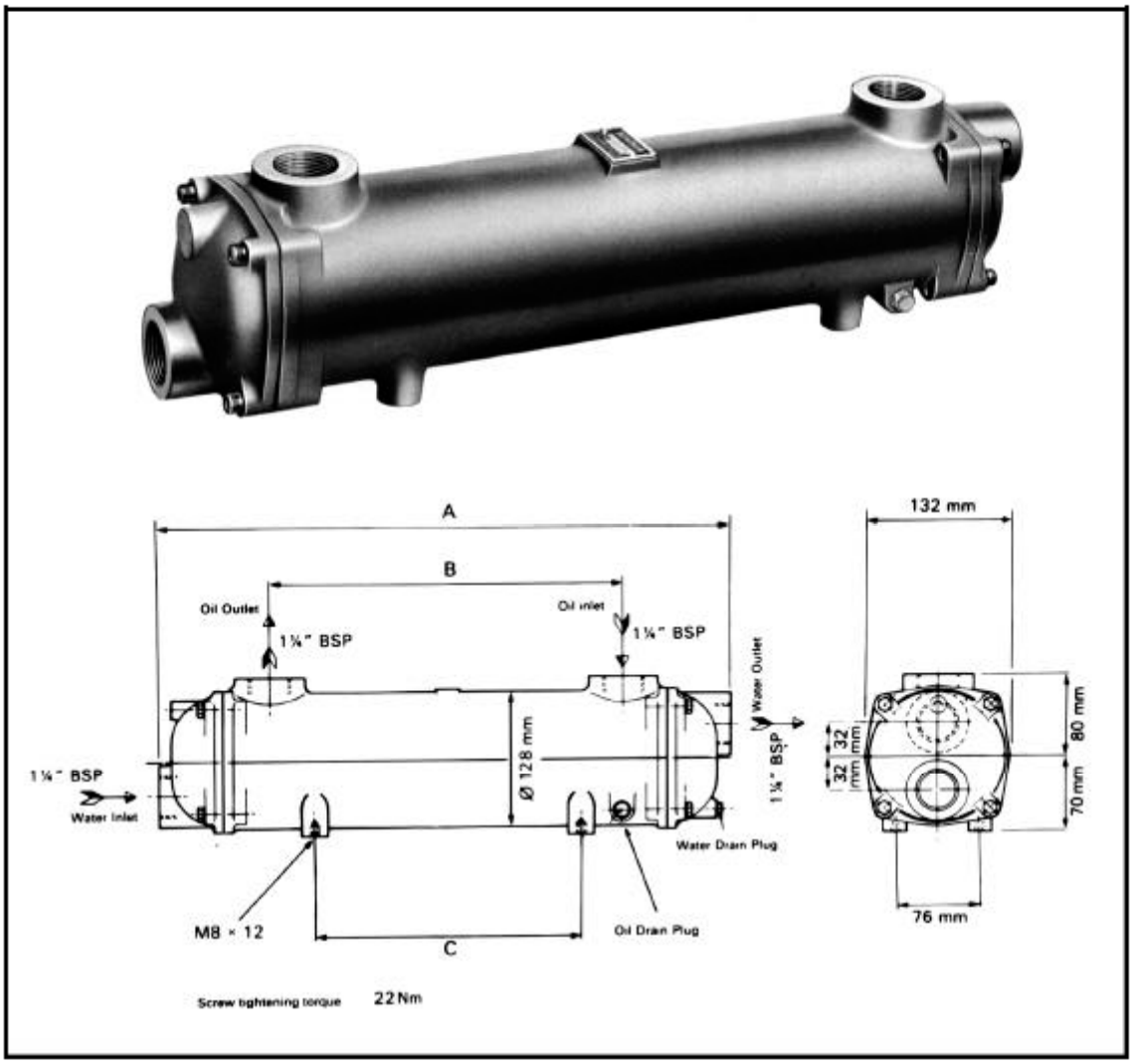

		A	B	C
	kg	mm	mm	mm
FG 80-1427-1	8.5	374	196	92
FG100-1427-2	10.0	472	294	190
FG120-1427-3	12.0	600	422	318
FG140-1427-4	14.5	746	568	464
FG160-1427-5	17.5	924	746	642

Maximum working oil pressure	20 bar
Maximum working water pressure	20 bar
Maximum working temperature	120°C

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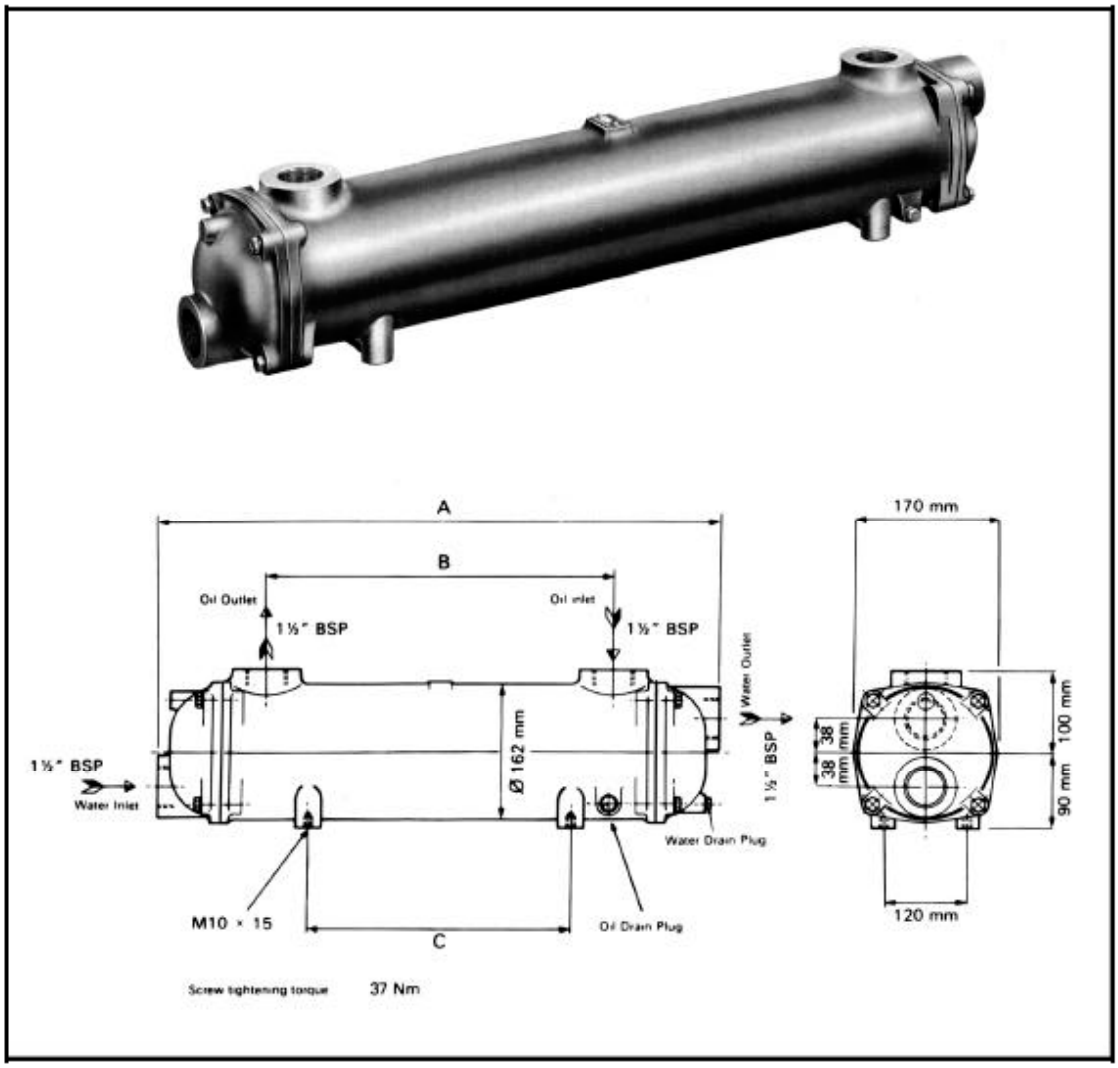

		A	B	C
	kg	mm	mm	mm
GL140-1428-2	18	502	272	108
GL180-1428-3	21	630	400	236
GL240-1428-4	25	776	546	382
GL320-1428-5	30	954	724	560
GL400-1428-6	36	1156	926	762
GL480-1428-7	42	1360	1130	966

Maximum working oil pressure	20 bar
Maximum working water pressure	20 bar
Maximum working temperature	120°C

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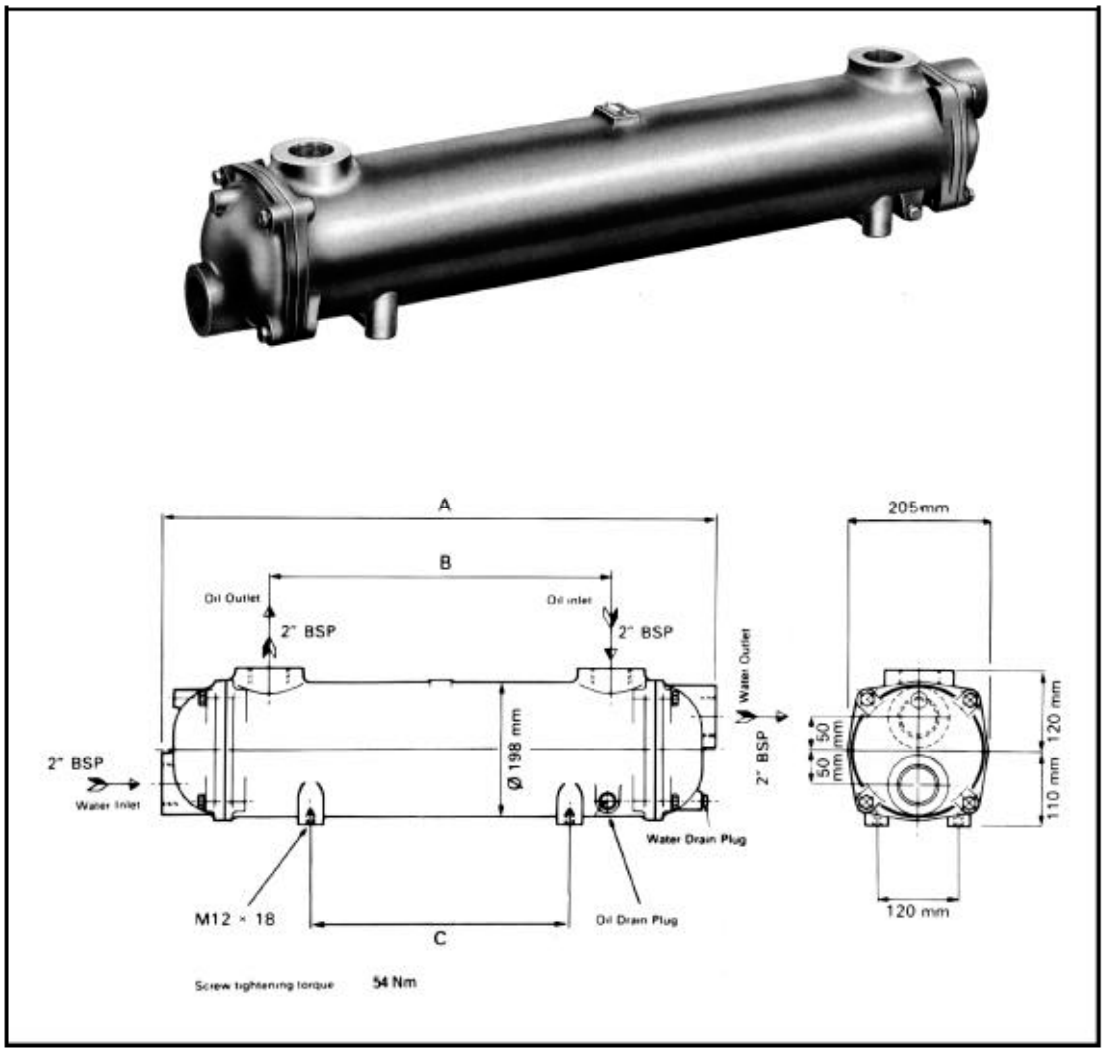

		A	B	C
	kg	mm	mm	mm
GK190-1658-3	34	674	370	236
GK250-1658-4	39	820	516	382
GK320-1658-5	46	998	694	560
GK400-1658-6	54	1200	896	762
GK480-1658-7	62	1404	1100	966
GK600-1658-8	74	1708	1404	1270

Maximum working oil pressure	20 bar
Maximum working water pressure	20 bar
Maximum working temperature	120°C

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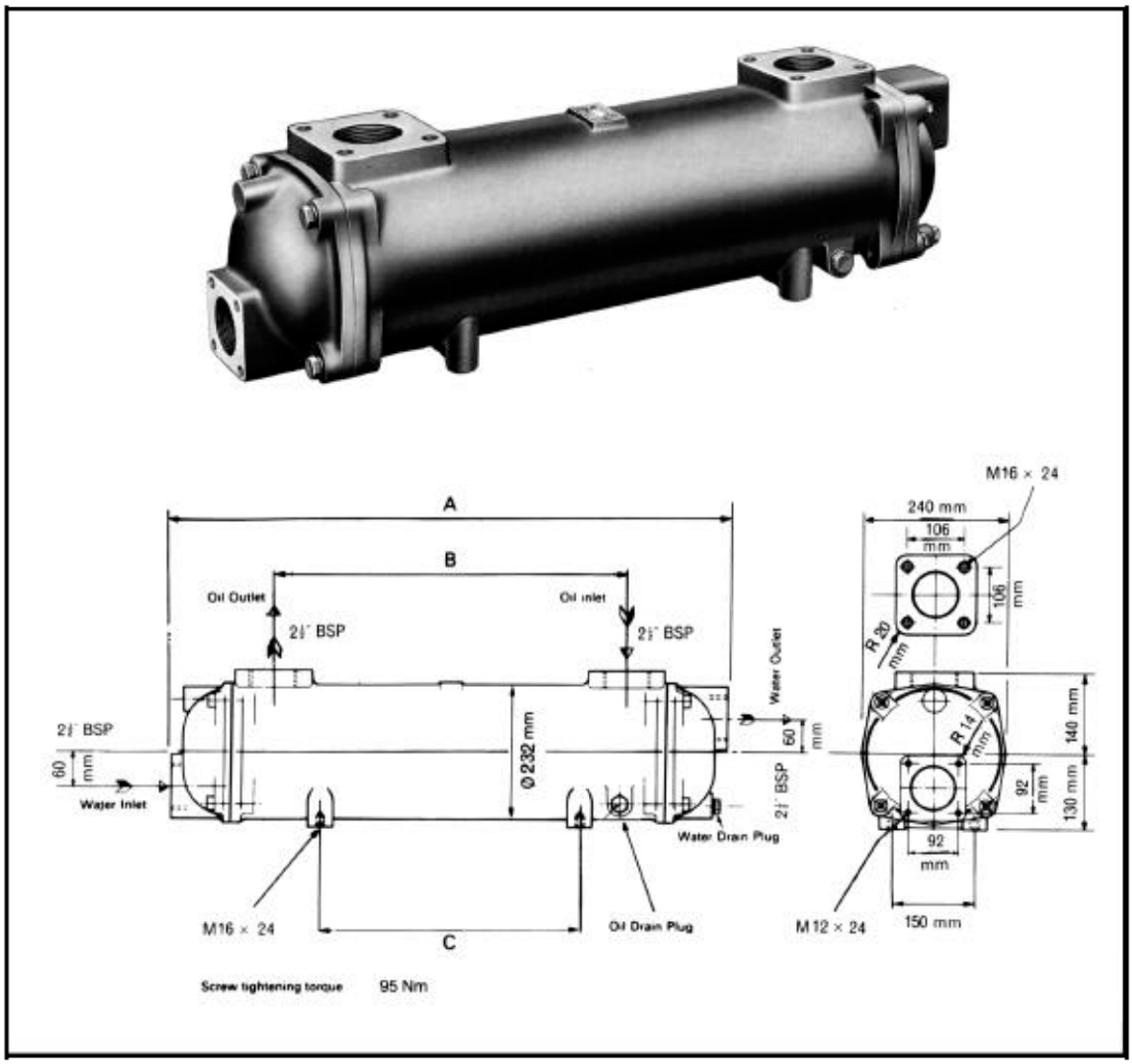
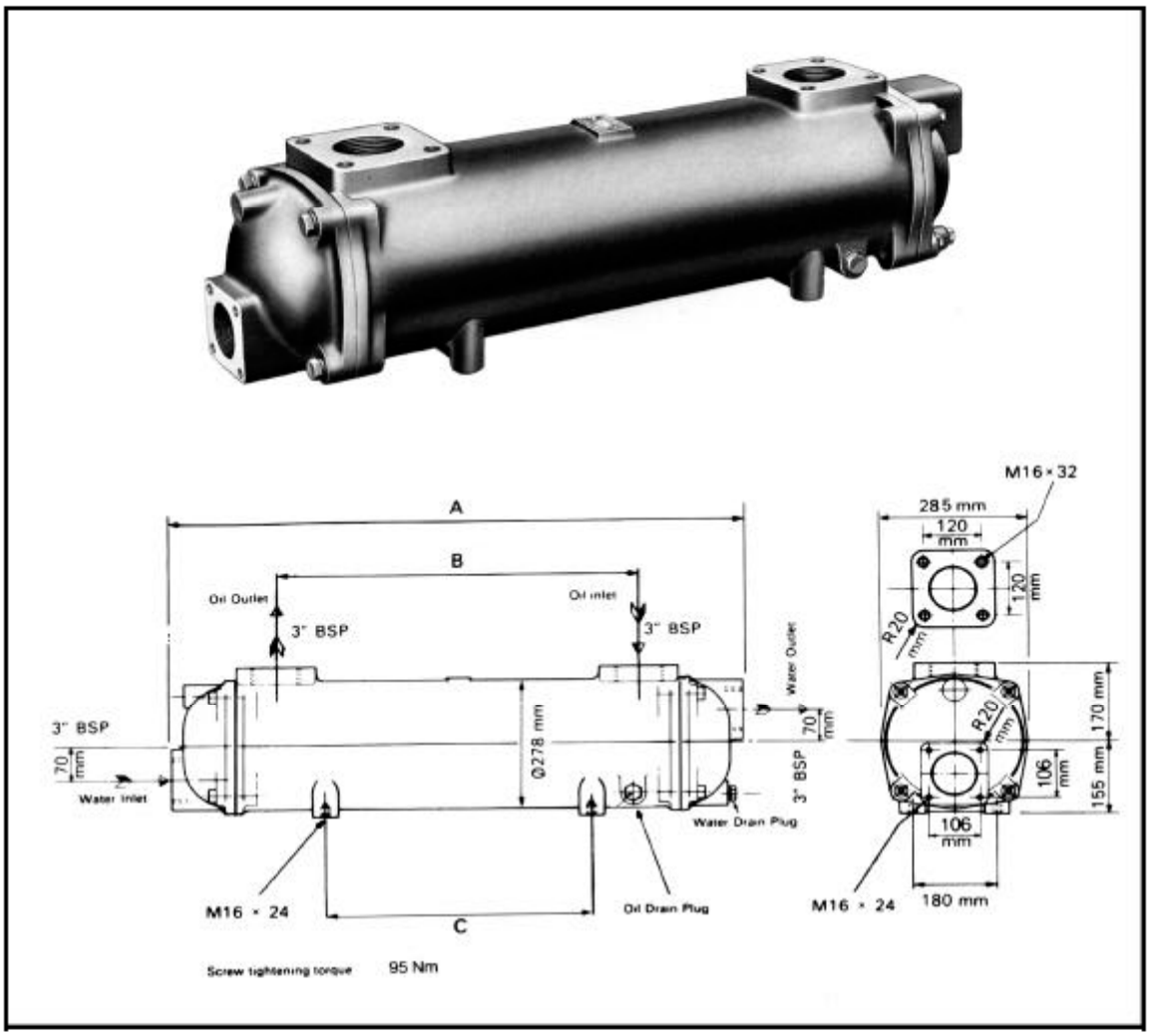


		A	B	C
	kg	mm	mm	mm
JK190-1661-3	58	704	340	236
JK250-1661-4	66	850	486	382
JK320-1661-5	78	1028	664	560
JK400-1661-6	92	1230	866	762
JK480-1661-7	105	1434	1070	966
JK600-1661-8	126	1738	1374	1270

Maximum working oil pressure	20 bar
Maximum working water pressure	20 bar
Maximum working temperature	120°C

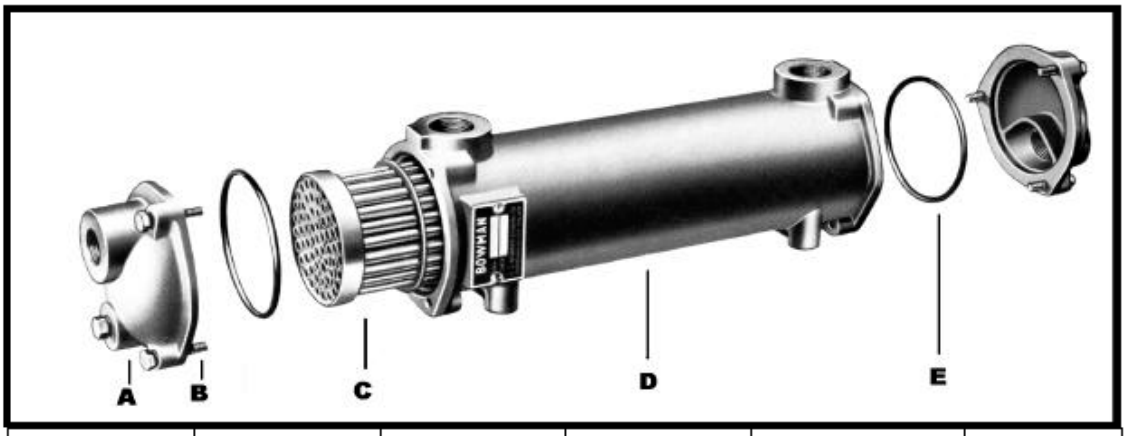
PK RANGE



		A	B	C
	kg	mm	mm	mm
PK190-1669-3	81	754	330	236
PK250-1669-4	94	900	476	382
PK320-1669-5	110	1078	654	560
PK400-1669-6	125	1280	856	762
PK480-1669-7	140	1484	1060	966
PK600-1669-8	158	1788	1364	1270

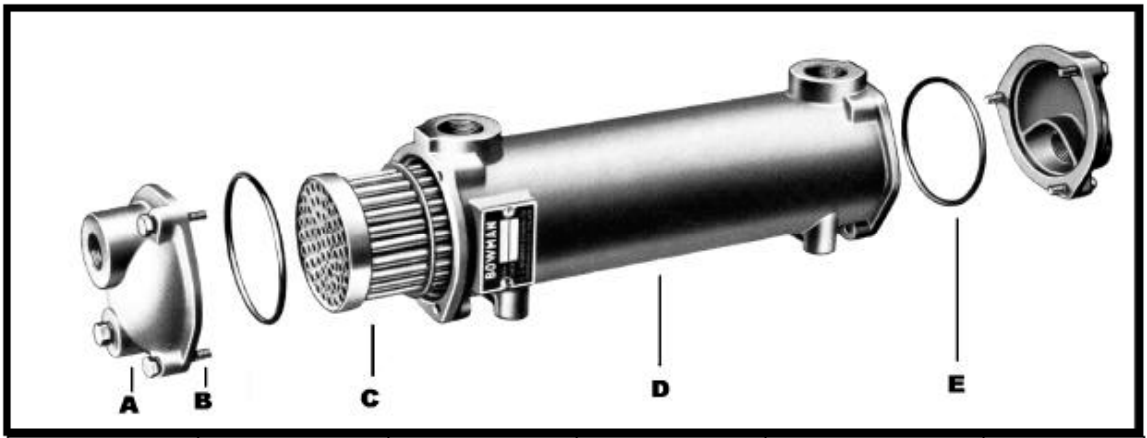
Maximum working oil pressure	20 bar
Maximum working water pressure	20 bar
Maximum working temperature	120°C

REPLACEMENT PARTS **STANDARD**



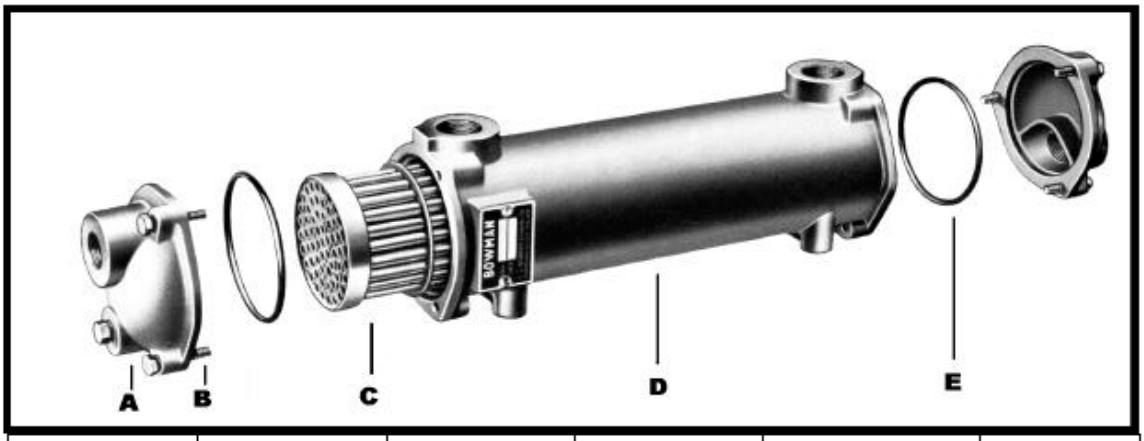
Type	A End covers	B Screws	C Tube Stack	D Body	E 'O' Seals
EC 80-1425-1	EC3-1040CI	HS06X30	785-1TN1A	EC21-978AL	AN12NT
EC100-1425-2	"	"	785-2TN1A	EC10-783-2AL	"
EC120-1425-3	"	"	785-3TN1A	EC12-783-3AL	"
EC140-1425-4	"	"	785-4TN1A	EC14-783-4AL	"
EC160-1425-5	"	"	785-5TN1A	EC16-783-5AL	"
FC 80-1426-1	FC3-1281CI	HS08X35	1530-1TN1A	FC 8-1200-1AL	OS46NT
FC100-1426-2	"	"	1530-2TN1A	FC10-1200-2AL	"
FC120-1426-3	"	"	1530-3TN1A	FC12-1200-3AL	"
FC140-1426-4	"	"	1530-4TN1A	FC14-1200-4AL	"
FC160-1426-5	"	"	1530-5TN1A	FC16-1200-5AL	"
FG 80-1427-1	FG3-1583CI	HS08X35	1959-1TN1A	FG 8-1650-1AL	OS52NT
FG100-1427-2	"	"	1959-2TN1A	FG10-1650-2AL	"
FG120-1427-3	"	"	1959-3TN1A	FG12-1650-3AL	"
FG140-1427-4	"	"	1959-4TN1A	FG14-1650-4AL	"
FG160-1427-5	"	"	1959-5TN1A	FG16-1650-5AL	"
GL140-1428-2	GL3-3141CI	HS10X40	1798-2TN1A	GL15-3136-2AL	OS63NT
GL180-1428-3	"	"	1798-3TN1A	GL19-3136-3AL	"
GL240-1428-4	"	"	1798-4TN1A	GL25-3136-4AL	"
GL320-1428-5	"	"	1798-5TN1A	GL33-3136-5AL	"
GL400-1428-6	"	"	1798-6TN1A	GL41-3136-6AL	"
GL480-1428-7	"	"	1798-7TN1A	GL49-3136-7AL	"
GK190-1658-3	GK1-2864CI	HS12X50	2315-3TN1A	GK19-2865-3AL	OS69NT
GK250-1658-4	"	"	2315-4TN1A	GK25-2865-4AL	"
GK320-1658-5	"	"	2315-5TN1A	GK32-2865-5AL	"
GK400-1658-6	"	"	2315-6TN1A	GK40-2865-6AL	"
GK480-1658-7	"	"	2315-7TN1A	GK48-2865-7AL	"
GK600-1658-8	"	"	2315-8TN1A	GK60-2865-8AL	"
JK190-1661-3	JK1-3333CI	HS16X70	3334-3TN1B	JK19-3332-3AL	OS74NT
JK250-1661-4	"	"	3334-4TN1B	JK25-3332-4AL	"
JK320-1661-5	"	"	3334-5TN1B	JK32-3332-5AL	"
JK400-1661-6	"	"	3334-6TN1B	JK40-3332-6AL	"
JK480-1661-7	"	"	3334-7TN1B	JK48-3332-7AL	"
JK600-1661-8	"	"	3334-8TN1B	JK60-3332-8AL	"
PK190-1669-3	PK1-2918CI	HS16X70	2829-3TN1B	PK19-2919-3AL	OS81NT
PK250-1669-4	"	"	2829-4TN1B	PK25-2919-4AL	"
PK320-1669-5	"	"	2829-5TN1B	PK32-2919-5AL	"
PK400-1669-6	"	"	2829-6TN1B	PK40-2919-6AL	"
PK480-1669-7	"	"	2829-7TN1B	PK48-2919-7AL	"
PK600-1669-8	"	"	2829-8TN1B	PK60-2919-8AL	"

REPLACEMENT PARTS MARINE



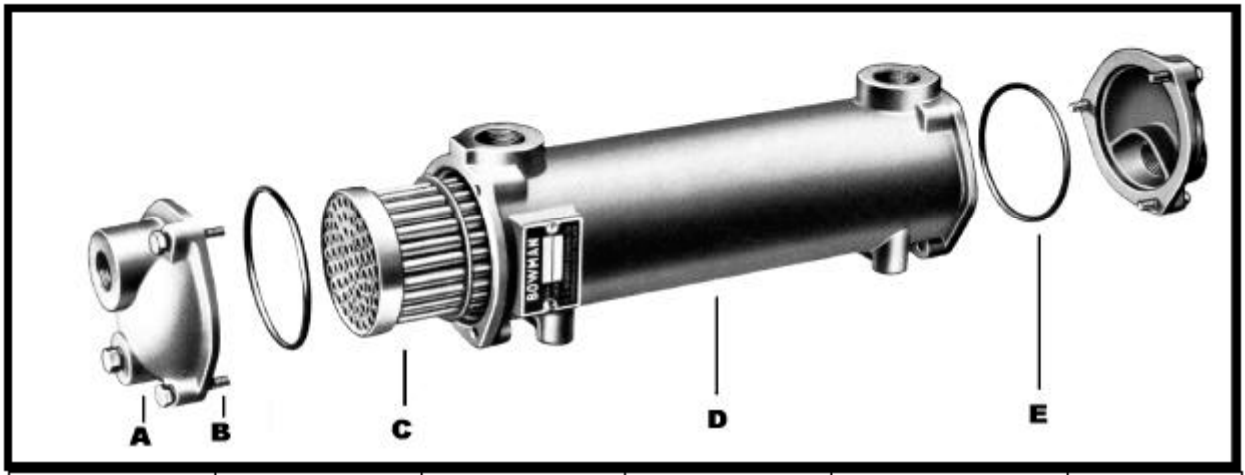
Type	A End covers	B Screws	C Tube Stack	D Body	E 'O' Seals
EC 80-3875-1	EC3-1040GM	HS06X30	785-1TN1A	EC21-978 AL	AN12NT
EC100-3875-2	"	"	785-2TN1A	EC10-783-2AL	"
EC120-3875-3	"	"	785-3TN1A	EC12-783-3AL	"
EC140-3875-4	"	"	785-4TN1A	EC14-783-4AL	"
EC160-3875-5	"	"	785-5TN1A	EC16-783-5AL	"
FC 80-3876-1	FC3-1281GM	HS08X35	1530-1TN1A	FC 8-1200-1AL	OS46NT
FC100-3876-2	"	"	1530-2TN1A	FC10-1200-2AL	"
FC120-3876-3	"	"	1530-3TN1A	FC12-1200-3AL	"
FC140-3876-4	"	"	1530-4TN1A	FC14-1200-4AL	"
FC160-3876-5	"	"	1530-5TN1A	FC16-1200-5AL	"
FG 80-3877-1	FG3-1583GM	HS08X35	1959-1TN1A	FG 8-1650-1AL	OS52NT
FG100-3877-2	"	"	1959-2TN1A	FG10-1650-2AL	"
FG120-3877-3	"	"	1959-3TN1A	FG12-1650-3AL	"
FG140-3877-4	"	"	1959-4TN1A	FG14-1650-4AL	"
FG160-3877-5	"	"	1959-5TN1A	FG16-1650-5AL	"
GL140-3878-2	GL3-3141GM	HS10X40	1798-2TN1A	GL15-3136-2AL	OS63NT
GL180-3878-3	"	"	1798-3TN1A	GL19-3136-3AL	"
GL240-3878-4	"	"	1798-4TN1A	GL25-3136-4AL	"
GL320-3878-5	"	"	1798-5TN1A	GL33-3136-5AL	"
GL400-3878-6	"	"	1798-6TN1A	GL41-3136-6AL	"
GL480-3878-7	"	"	1798-7TN1A	GL49-3136-7AL	"
GK190-3879-3	GK1-2864GM	HS12X50	2315-3TN1A	GK19-2865-3AL	OS69NT
GK250-3879-4	"	"	2315-4TN1A	GK25-2865-4AL	"
GK320-3879-5	"	"	2315-5TN1A	GK32-2865-5AL	"
GK400-3879-6	"	"	2315-6TN1A	GK40-2865-6AL	"
GK480-3879-7	"	"	2315-7TN1A	GK48-2865-7AL	"
GK600-3879-8	"	"	2315-8TN1A	GK60-2865-8AL	"
JK190-3881-3	JK1-3333GM	HS16X70	3334-3TN1B	JK19-3332-3AL	OS74NT
JK250-3881-4	"	"	3334-4TN1B	JK25-3332-4AL	"
JK320-3881-5	"	"	3334-5TN1B	JK32-3332-5AL	"
JK400-3881-6	"	"	3334-6TN1B	JK40-3332-6AL	"
JK480-3881-7	"	"	3334-7TN1B	JK48-3332-7AL	"
JK600-3881-8	"	"	3334-8TN1B	JK60-3332-8AL	"
PK190-3880-3	PK1-2918GM	HS16X70	2829-3TN1B	PK19-2919-3AL	OS81NT
PK250-3880-4	"	"	2829-4TN1B	PK25-2919-4AL	"
PK320-3880-5	"	"	2829-5TN1B	PK32-2919-5AL	"
PK400-3880-6	"	"	2829-6TN1B	PK40-2919-6AL	"
PK480-3880-7	"	"	2829-7TN1B	PK48-2919-7AL	"
PK600-3880-8	"	"	2829-8TN1B	PK60-2919-8AL	"

REPLACEMENT PARTS 150° C OIL



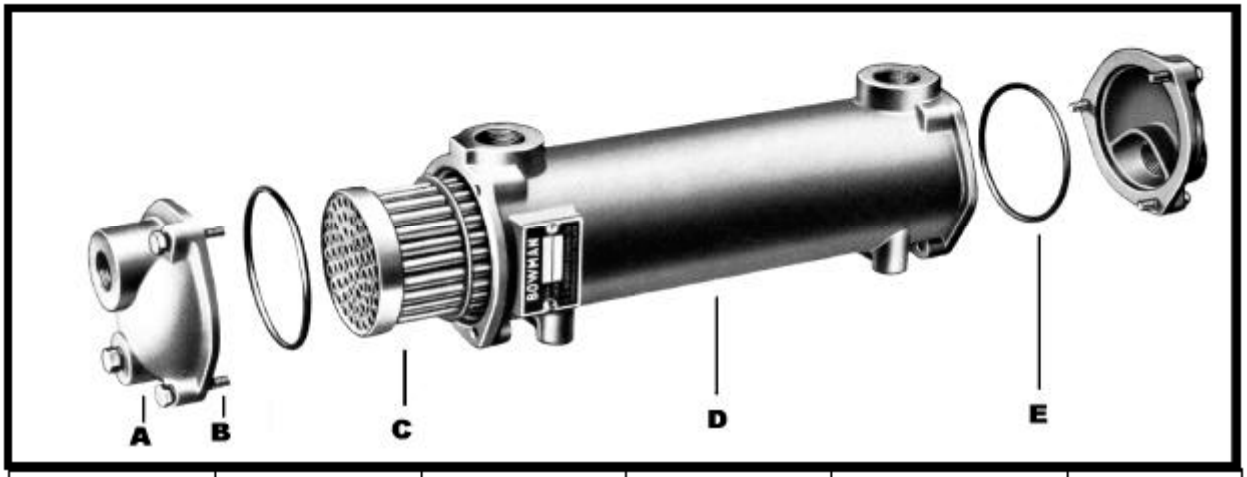
Type	A End covers	B Screws	C Tube Stack	D Body	E 'O' Seals
EC 80-3145-1	EC3-1040CI	HS06X30	785-1TN2A	EC21-978 AL	AN12VT
EC100-3145-2	"	"	785-2TN2A	EC10-783-2AL	"
EC120-3145-3	"	"	785-3TN2A	EC12-783-3AL	"
EC140-3145-4	"	"	785-4TN2A	EC14-783-4AL	"
EC160-3145-5	"	"	785-5TN2A	EC16-783-5AL	"
FC 80-3146-1	FC3-1281CI	HS08X35	1530-1TN2A	FC 8-1200-1AL	OS46VT
FC100-3146-2	"	"	1530-2TN2A	FC10-1200-2AL	"
FC120-3146-3	"	"	1530-3TN2A	FC12-1200-3AL	"
FC140-3146-4	"	"	1530-4TN2A	FC14-1200-4AL	"
FC160-3146-5	"	"	1530-5TN2A	FC16-1200-5AL	"
FG 80-3147-1	FG3-1583CI	HS08X35	1959-1TN2A	FG 8-1650-1AL	OS52VT
FG100-3147-2	"	"	1959-2TN2A	FG10-1650-2AL	"
FG120-3147-3	"	"	1959-3TN2A	FG12-1650-3AL	"
FG140-3147-4	"	"	1959-4TN2A	FG14-1650-4AL	"
FG160-3147-5	"	"	1959-5TN2A	FG16-1650-5AL	"
GL140-3148-2	GL3-3141CI	HS10X40	1798-2TN2A	GL15-3136-2AL	OS63VT
GL180-3148-3	"	"	1798-3TN2A	GL19-3136-3AL	"
GL240-3148-4	"	"	1798-4TN2A	GL25-3136-4AL	"
GL320-3148-5	"	"	1798-5TN2A	GL33-3136-5AL	"
GL400-3148-6	"	"	1798-6TN2A	GL41-3136-6AL	"
GL480-3148-7	"	"	1798-7TN2A	GL49-3136-7AL	"
GK190-3149-3	GK1-2864CI	HS12X50	2315-3TN2A	GK19-2865-3AL	OS69VT
GK250-3149-4	"	"	2315-4TN2A	GK25-2865-4AL	"
GK320-3149-5	"	"	2315-5TN2A	GK32-2865-5AL	"
GK400-3149-6	"	"	2315-6TN2A	GK40-2865-6AL	"
GK480-3149-7	"	"	2315-7TN2A	GK48-2865-7AL	"
GK600-3149-8	"	"	2315-8TN2A	GK60-2865-8AL	"
JK190-3152-3	JK1-3333CI	HS16X70	3334-3TN2B	JK19-3332-3AL	OS74VT
JK250-3152-4	"	"	3334-4TN2B	JK25-3332-4AL	"
JK320-3152-5	"	"	3334-5TN2B	JK32-3332-5AL	"
JK400-3152-6	"	"	3334-6TN2B	JK40-3332-6AL	"
JK480-3152-7	"	"	3334-7TN2B	JK48-3332-7AL	"
JK600-3152-8	"	"	3334-8TN2B	JK60-3332-8AL	"
PK190-3150-3	PK1-2918CI	HS16X70	2829-3TN2B	PK19-2919-3AL	OS81VT
PK250-3150-4	"	"	2829-4TN2B	PK25-2919-4AL	"
PK320-3150-5	"	"	2829-5TN2B	PK32-2919-5AL	"
PK400-3150-6	"	"	2829-6TN2B	PK40-2919-6AL	"
PK480-3150-7	"	"	2829-7TN2B	PK48-2919-7AL	"
PK600-3150-8	"	"	2829-8TN2B	PK60-2919-8AL	"

REPLACEMENT PARTS 200°C OIL



Type	A End covers	B Screws	C Tube Stack	D Body	E 'O' Seals
EC120-3635-3	EC3-1040CI	HS06X30	785-3TN3B	EC12-783-3CI	AN12VT
FC100-3636-2	FC3-1281CI	HS08X35	1530-2TN3B	FC10-1200-2CI	OS46VT
FG100-3637-2	FG3-1583CI	HS08X35	1959-2TN3B	FG10-1650-2CI	OS52VT
FG140-3637-4	"	"	1959-4TN3B	FG14-1650-4CI	"
GL140-3638-2	GL3-3141CI	HS10X40	1798-2TN3B	GL15-3136-2CI	OS63VT
GL240-3638-4	"	"	1798-4TN3B	GL25-3136-4CI	"

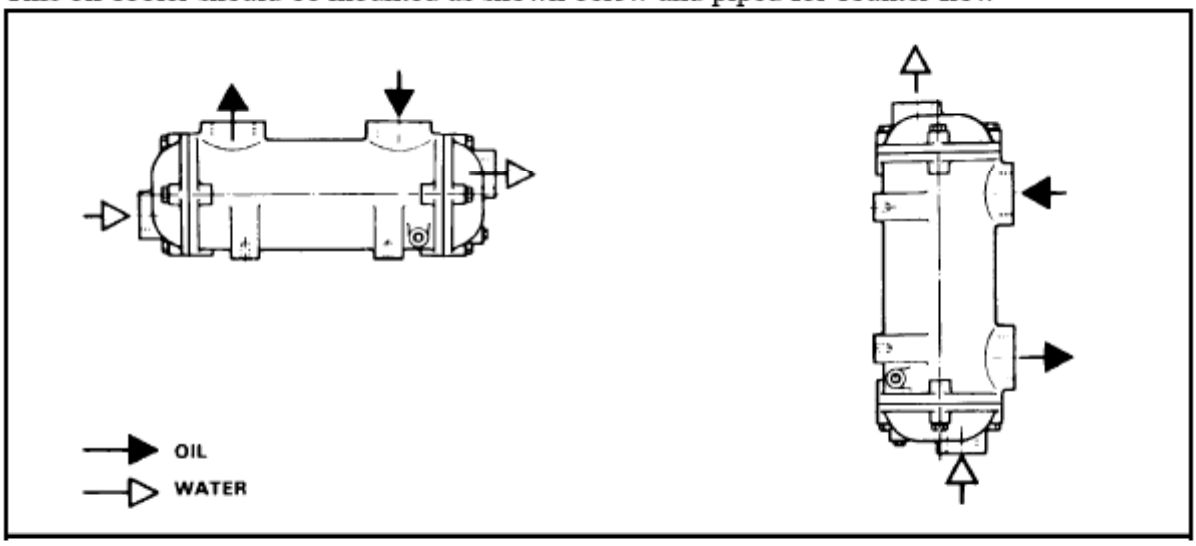
RELACEMENT PARTS **MINING**



Type	A End covers	B Screws	C Tube Stack	D Body	E 'O' Seals
EC120-3425-3	EC23-4033CI	HS06X30	785-3TN3B	EC12-783-3CI	AN12VT
FC100-3426-2	FC23-4034CI	HS08X35	1530-2TN3B	FC10-1200-2CI	OS46VT
FG100-3427-2	FG23-4035CI	HS08X35	1959-2TN3B	FG10-1650-2CI	OS52VT
FG140-3427-4	"	"	1959-4TN3B	FG14-1650-4CI	"
GL140-3428-2	GL23-4036CI	HS10X40	1798-2TN3B	GL15-3136-2CI	OS63VT
GL240-3428-4	"	"	1798-4TN3B	GL25-3136-4CI	"

SHIPBOARD INSTALLATION OF HYDRAULIC OIL COOLERS

This oil cooler should be mounted as shown below and piped for counter flow -



If the sea water supply is taken from the ship's main, ensure that the recommended flow rate cannot be exceeded. This will normally mean that an orifice plate must be fitted in the pipe work at least 1 metre before the cooler with the orifice size calculated to ensure that the maximum sea water flow rate cannot be exceeded. If these precautions are not taken, it is possible that the sea water flow rate through the cooler may be several times the recommended maximum, which will lead to rapid failure. For our oil coolers, the maximum permitted sea water flow rates are as follows :-

EC Range	30 l/min	GL range	120 l/ min
FC Range	50 l/min	GK range	220 l/ min
FG Range	90 l/min	JK range	350 l/ min
		PK range	500 l/ min

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 the 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.

Recommended orifice plate sizes.

Oil cooler series	Max sea water flow l/min	Orifice diameter in mm for max. sea water flow							
		3 bar	4 bar	5 bar	6 bar	7 bar	8 bar	9 bar	10 bar
EC	30	6.6	6.2	5.8	5.6	5.3	5.2	5.0	4.9
FC	50	8.6	8.0	7.5	7.2	6.9	6.6	6.5	6.3
FG	90	12	11	10	9.6	9.2	8.9	8.7	8.4
GL	120	13	12	12	11	11	10	10	10
GK	220	18	17	16	15	15	14	14	13
JK	340	23	21	20	19	18	17	17	16
PK	500	27	25	24	23	22	21	20	20