Selection procedure

Step 1. Determine the Heat Load.
This will vary with different systems, but typically coolers are sized to remove 25 to 50% of the system's input total maximum power rating. (Example: 75kW Power Unit x .33 = 25kW Heat Load)

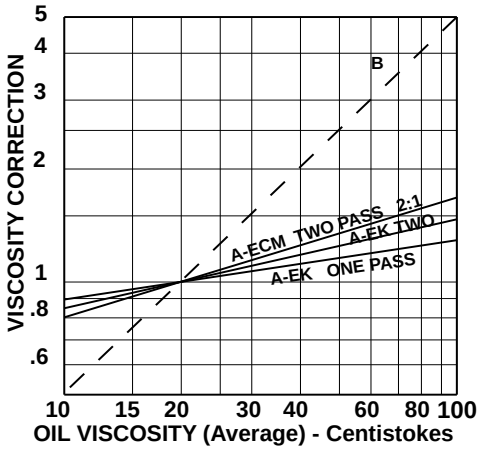
Step 2. Determine Approach Temperature.
Desired exit oil temp°C - Water inlet temp°C = Actual Approach

Step 3. Determine Curve kW Heat Load.
Enter the information from above:
kW heat load x 25 x Viscosity Correction A = Curve kW load
Actual approach

Step 4. Find Curve Operating Point.
Locate on the graph the point determined by the oil flow and the curve kW heat load. Any cooler curve above this point will have sufficient capacity.

Step 5. Determine Oil Pressure Drop from Curves.
● = 0.5 Bar ■ = 1.0 Bar ▲= 2.0 Bar
Multiply pressure drop from curve by correction factor B found on oil viscosity correction curve.

OIL VISCOSITY CORRECTION MULTIPLIERS



Performance curves are based on ISO VG 32 oil leaving the cooler 25°C higher than the incoming water temperature used for cooling. This is also referred to as a 25°C approach temperature.

- Extended surface to minimise water consumption
- Corrosion resistant 90/10 copper nickel tubes as standard (Cu optional)
- Water Flow Controls & Strainers available as options see pages 54 & 55
- Surge-Cushion 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.

TECHNICAL SPECIFICATIONS

Materials

Shell..... Steel
Tubes..... Copper/Nickel
Tubesheets..... Steel
Baffles..... Steel
Fins..... Aluminium
Mounting Brackets..... Steel
End Caps..... Grey Iron
Gaskets ..... Nitrile Rubber/Cellulose Fibre
Nameplate ..... Aluminium Foil

Maximum Flow Rates

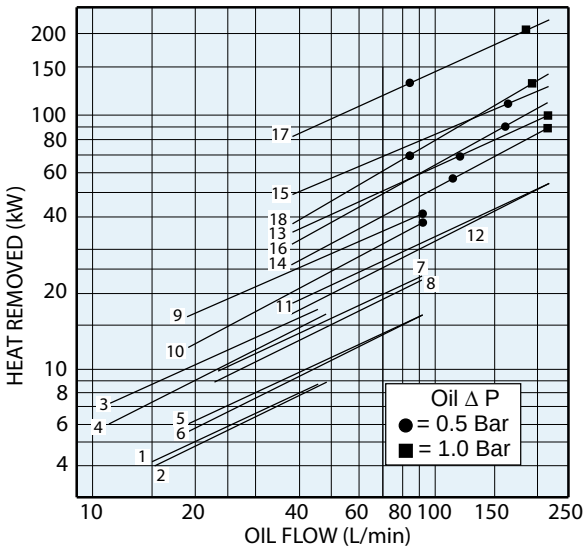
Unit Size	Shell Side Litres/Min.	Tube Side Litres/min. One Pass	Two Pass	Four Pass
25EK	75	50	23	N/A
35EK	225	90	45	23
50EK	302	212	106	53

Ratings

Maximum shell side pressure. . . . . 35 Bar
Maximum tube side pressure. . . . . 10 Bar
Maximum temperature. . . . . 120°C

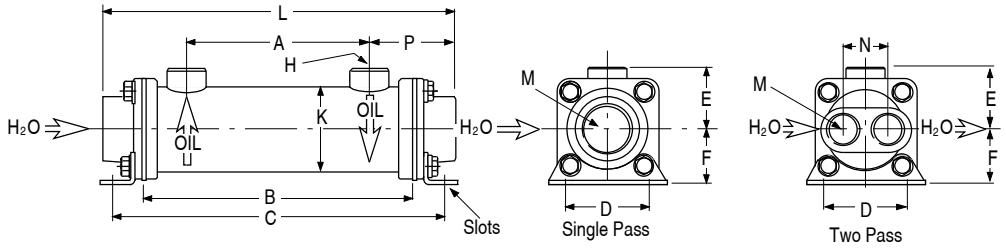
PERFORMANCE 1:1 Oil to Water Ratio One Pass Models & 2:1 Oil to Water Ratio Two Pass Models

	Models	Part No	Wt kg
1.	25EK1/1	**65/EK5080S***	3.0
2.	25EK1/2	**65/EK508TS***	3.1
3.	25EK4/1	**65/EK5140S***	5.0
4.	25EK4/2	**65/EK514TS***	5.0
5.	35EK1/1	**65/EK7080**	6.2
6.	35EK1/2	**65/EK708T**	6.2
7.	35EK2/1	**65/EK7120**	7.2
8.	35EK2/2	**65/EK712T**	7.2
9.	35EK4/1	**65/EK7180**	8.4
10.	35EK4/2	**65/EK718T**	8.4
11.	50EK2/1	**65/EK10120**	16.6
12.	50EK2/2	**65/EK1012T**	16.6
13.	50EK4/1	**65/EK10180**	19.1
14.	50EK4/2	**65/EK1018T**	19.1
15.	50EK5/1	**65/EK10240**	22.2
16.	50EK5/2	**65/EK1024T**	22.2
17.	50EK6/1	**65/EK10360**	30.4
18.	50EK6/2	**65/EK1036T**	30.4



*To order with Surge Relief omit S to part No.

25 EK SERIES

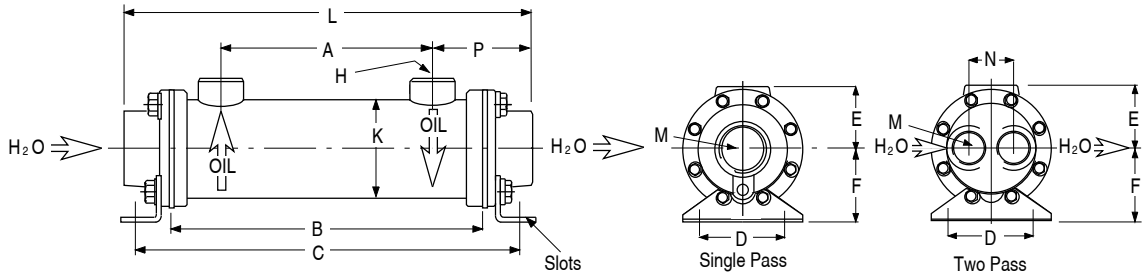


Surge cushion internal bypass relief available on 25 EK series as an option.

COMMON DIMENSIONS									Single Pass Models				Two Pass Models			
Model	**A**	**B**	**C**	**D**	**E**	**F**	**H***	**K**		**L**	**M***	**P**		**L**	**M***	**N**	**P**
25EK1	97.8	204.5	261.9	63.5	58.0	41.1	3/4”	64.8	**25EK1/1**	259.8	3/4”	82.8	**25EK1/2**	260.3	3/8”	28.4	82.8
25EK4	250.2	360.2	417.6	63.5	58.0	41.1	3/4”	64.8	**25EK4/1**	416.0	3/4”	82.8	**25EK4/2**	416.0	3/8”	28.4	82.8

*All ports are BSPP female pipe thread to ISO 228/1G Mount Slots 25EK = 8.6 x 12.7 Tolerance ± 3mm

35 EK SERIES

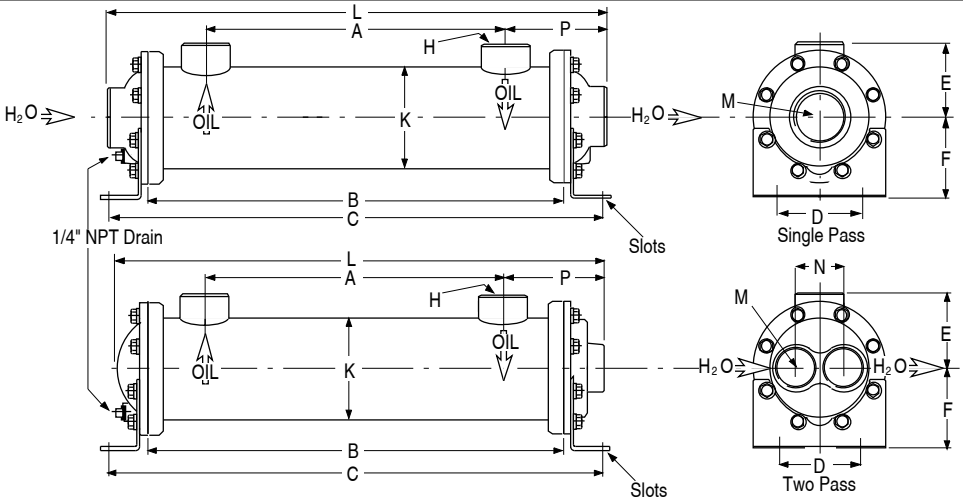


Surge cushion internal bypass relief supplied on all 35 and 50 EK series.

COMMON DIMENSIONS									Single Pass Models				Two Pass Models			
Model	**A**	**B**	**C**	**D**	**E**	**F**	**H***	**K**		**L**	**M***	**P**		**L**	**M***	**N**	**P**
35EK1	76.2	204.5	268.5	76.2	70.9	65.8	11/2”	89.4	**35EK1/1**	279.2	11/4”	101.6	**35EK1/2**	242.6	3/4”	41.2	88.9
35EK2	177.8	306.1	370.1	76.2	70.9	65.8	11/2”	89.4	**35EK2/1**	380.8	11/4”	101.6	**35EK2/2**	344.2	3/4”	41.2	88.9
35EK4	330.2	458.5	522.5	76.2	70.9	85.8	11/2”	89.4	**35EK4/1**	533.2	11/4”	101.6	**35EK4/2**	496.6	3/4”	41.2	88.9

*All ports are BSPP female pipe thread to ISO 228/1G Mount Slots 35EK = 11 x 19 Tolerance ± 3mm

50 EK SERIES



Surge cushion internal bypass relief supplied on all 35 and 50 EK series.

COMMON DIMENSIONS									Single Pass Models				Two Pass Models			
Model	**A**	**B**	**C**	**D**	**E**	**F**	**H***	**K**		**L**	**M***	**P**		**L**	**M***	**N**	**P**
50EK2	157.0	301.8	388.9	101.6	94.5	101.6	11/2”	128.3	**50EK2/1**	385.6	11/2”	114.3	**50EK2/2**	366.8	1”	60.5	113
50EK4	309.4	454.2	541.3	101.6	94.5	101.6	11/2”	128.3	**50EK4/1**	538.0	11/2”	114.3	**50EK4/2**	519.2	1”	60.5	113
50EK5	461.8	606.6	693.7	101.6	94.5	101.6	11/2”	128.3	**50EK5/1**	690.4	11/2”	114.3	**50EK5/2**	671.6	1”	60.5	113
50EK6	766.6	911.4	998.5	101.6	94.5	101.6	11/2”	128.3	**50EK6/1**	995.2	11/2”	114.3	**50EK6/2**	976.4	1”	60.5	113

*All ports are BSPP female pipe thread to ISO 228/1G Mount Slots 50EK = 11 x 25 Tolerance ± 3mm

- Extended surface to minimise water consumption
- Anodes, Cu Ni Tubes available as options
- Water Flow Controls & Strainers available as options

TECHNICAL SPECIFICATIONS

Materials

Shell..... Steel
Tubes..... Copper or Copper/Nickel
Tubesheets..... Steel
Baffles..... Steel
Fins..... Aluminium
Mounting Brackets..... Steel
End Caps..... Grey Iron
Gaskets ..... Nitrile Rubber/Cellulose Fibre
Nameplate ..... Aluminium Foil
Anodes available as optional extra.

Maximum Flow Rates

Unit Size	Shell Side Litres/Min	Tube Side Litres/min. One Pass	Two Pass
ECM1700	948	834	417
ECM1200	456	456	228

Ratings

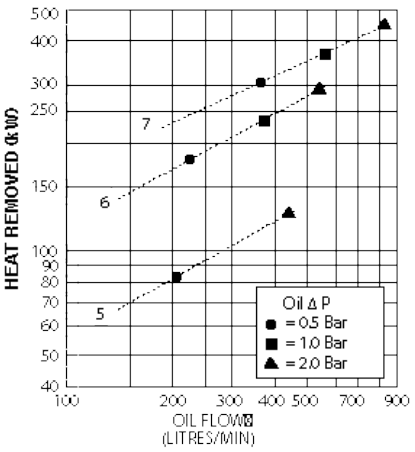
Maximum shell side pressure. . . . . 20 Bar
Maximum tube side pressure. . . . . .10 Bar
Maximum temperature. . . . . ..145°C

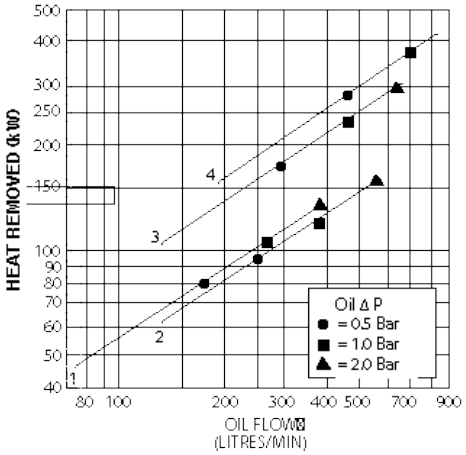
PERFORMANCE

	Part No	Wt kg
*1.	**65/ECM/1236/TSW**	56.8
2.	**65/ECM/1724/6/T**	66.0
3.	**65/ECM/1754/9/T**	125.0
4.	**65/ECM/1784/14/T**	177.0
5.	**65/ECM/1724/6/S**	66.0
6.	**65/ECM/1754/9/S**	125.0
7.	**65/ECM/1784/14/S**	177.0

* This unit suitable for seawater as coolant. Cu Ni Tubes, SS316 Tubesheet and Bronze Bonnets.

Performance curves are based on ISO VG 32 oil leaving the cooler 25°C higher than the incoming water temperature used for cooling. This is also referred to as a 25°C approach temperature.
For correction curves see page 42.



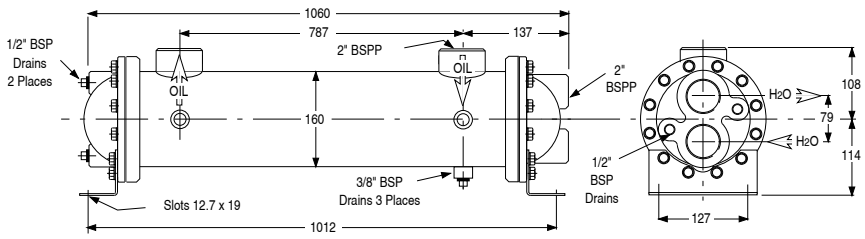


DIMENSIONS

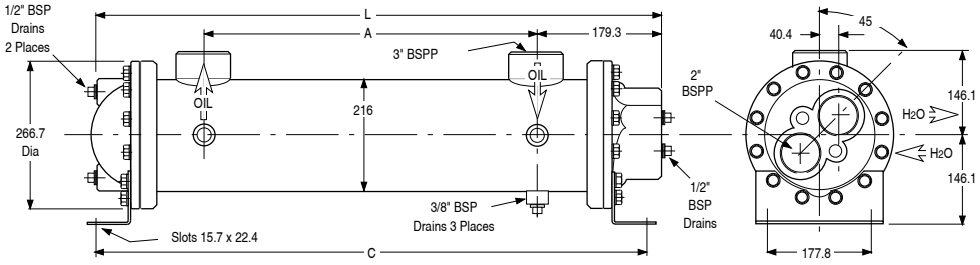
	A	C	L
ECM1724/S	476	743	818
ECM1754/S	1238	1505	1606
ECM1784/S	2000	2267	2368
ECM1724/T	476	743	822
ECM1754/T	1238	1505	1584
ECM1784/T	2000	2267	2346

All ports are BSPP female pipe thread to ISO 228/1G
Mount slots 15.7 x 22.4 in 4 places
Tolerance ± 3mm UNO.

Model ECM/1236



Model ECM/1724, ECM/1754 & ECM/1784



Applications

- ***Marine***
- ***Brackish Water***
- ***Air Aftercooling***
- ***Water to Water***

Technical Specifications

Materials

Tubes	Copper Nickel (90/10)
Tubesheets	Brass
Shell	Steel (Brass optional)
Shell Connections	Brass
Baffles	Brass
End Bonnets	Bronze
Mounting Brackets	Steel
Gaskets	Nitrile Rubber/Cellulose Fibre
Hardware	Alloy Steel/Optional SS
Anodes	Zinc in Alloy Steel

Ratings

Maximum shell side pressure. . . . . 17 Bar
Maximum tube side pressure. . . . . .10 Bar
Maximum temperature. . . . . ..175°C

Part No.	Shell Side (L/min)	Tube Side (L/min)	Capacity (kW)*
65/B0401/OSW	36	94	4.5
65/B0701/OSW	64	230	12
65/B0701/FSW	64	56	11
65/B0702/OSW	110	230	18
65/B0702/FSW	110	56	16
65/B1003/OSW	260	550	64
65/B1003/TSW	260	270	60
65/B1006/OSW	260	550	75
65/B1006/TSW	260	270	70
65/B1206/OSW	435	848	150
65/B1206/FSW	435	210	145
65/B1608/OSW	960	1374	380
65/B1608/FSW	960	345	370

* Performance based on ISO68 oil in shell leaving at 22°C above cooling water entering temperature in tubes. Fluids at maximum flow rates. For capacities at other operating conditions consult our sales office.

DIMENSIONS

One Pass (Code "0")

	M	N	P	Q*
B0401/OSW	286	46	-	1"
B0701/OSW	347	82	3/8"	1 1/2"
B0702/OSW	575	82	3/8"	1 1/2"
B1003/OSW	828	103	3/8"	2"
B1006/OSW	1520	103	3/8"	2"
B1206/OSW	1530	124	1/2"	3"
B1608/OSW	2048	166	1/2"	4"

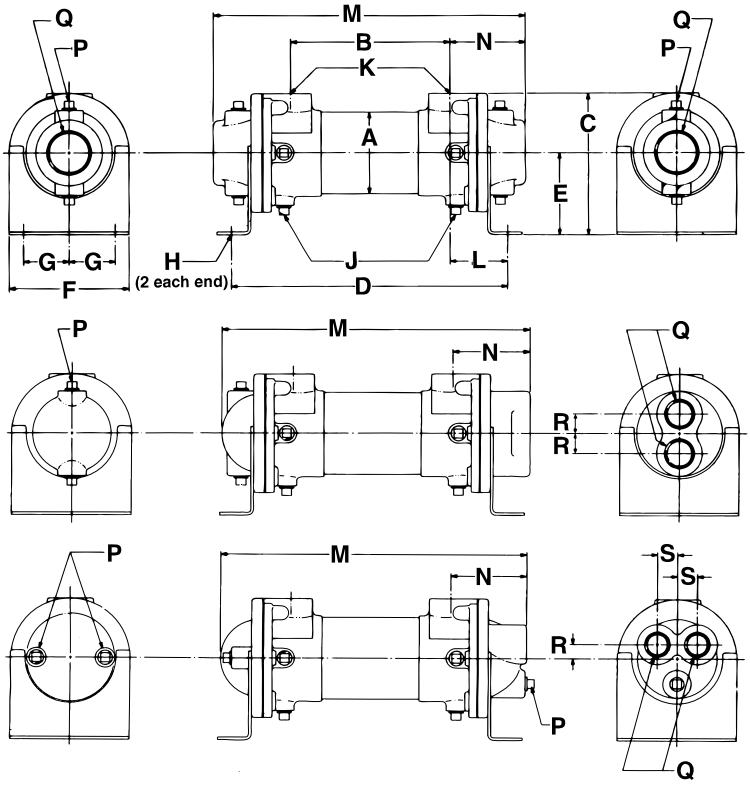
Two Pass (Code "T")

	M	N	P	Q*	R
B1003/TSW	820	97	3/8"	1 1/2"	30
B1006/TSW	1520	97	3/8"	1 1/2"	30

Four Pass (Code "F")

	M	N	P	Q*	R	S
B701/FSW	345	59	3/8"	3/4"	16	22
B702/FSW	573	59	3/8"	3/4"	16	22
B1206/FSW	1532	125	1/2"	1 1/2"	27	36
B1608/FSW	2050	165	1/2"	2"	35	48

All dimensions are ± 2%.



COMMON DIMENSIONS

	A	B	C	D	E	F	G	H	J	K*	L	Wt kg
B0401	54.0	193.5	88.9	279.7	49.3	66.6	22.4	Ø10.4	-	1/2"	43.7	3.2
B0701	92.9	177.8	158.8	305.1	91.9	133.4	38.1	Ø11x25	3/8"	1"	68.3	10.5
B0702	92.9	406.4	158.8	533.7	91.9	133.4	38.1	Ø11x25	3/8"	1"	68.3	12.7
B1003	130.2	622.3	187.5	780.0	101.6	171.5	50.8	Ø11x25	3/8"	1 1/2"	77.7	29.5
B1006	130.2	1314.2	187.5	1472.0	101.6	171.5	50.8	Ø11x25	3/8"	1 1/2"	77.7	40.0
B1206	155.6	1282.7	223.8	1457.5	120.7	190.5	63.5	Ø11x22	3/8"	2"	87.4	72.6
B1608	203.2	1717.0	308.1	1940.1	165.1	218.9	88.9	Ø11x25	3/8"	3"	111.5	141.0

All ports are NPT female pipe thread. BSPP available. Ports Q for cooling fluid only. Port K for oil or fluid to be cooled.

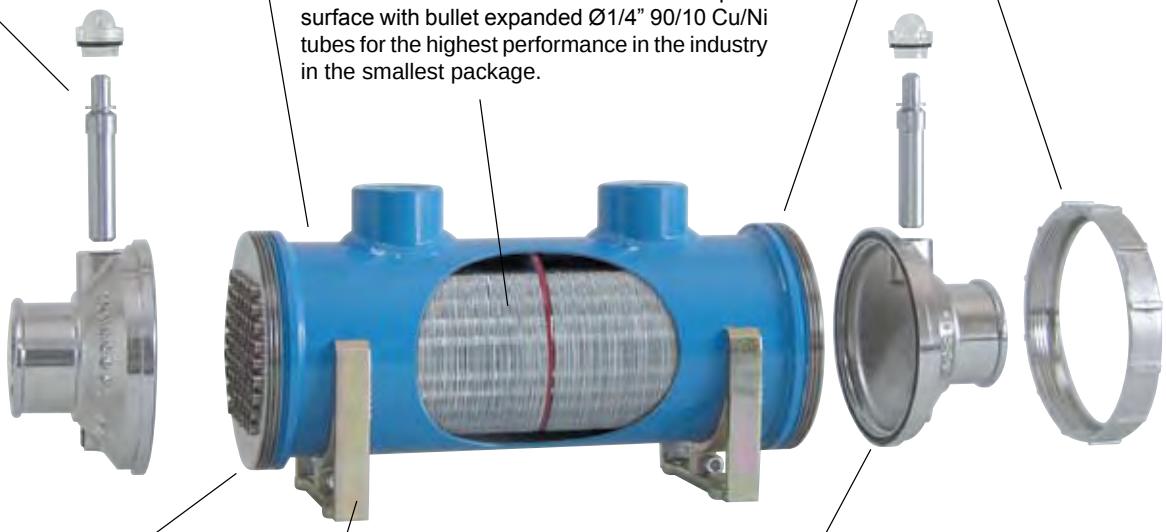
WOULD YOU PROTECT YOUR INVESTMENT WITH ANY OTHER OIL COOLER?

WM coolers are supplied with Zinc anodes fitted. WM single pass models are supplied with 2 sacrificial anodes and WM two pass models with 1 sacrificial anode. Anode cavities are accessed via a clear cap for tell tale anode condition viewing.

Rugged steel shell, electric welded to the tubesheet for resistance to pressure failure. Oil port nozzles are also electric welded to the shell.

End bonnets are all connected to the bundle using the unique threaded gland nut design which secures the bonnets in any radial orientation especially useful when using 90° bend bonnets or difficult anode access. Sealing is by O ring.

Fixed bundle oil side extended aluminium plate surface with bullet expanded Ø1/4" 90/10 Cu/Ni tubes for the highest performance in the industry in the smallest package.



Tubesheets are 11mm thick with expanded connection. WI coolers have steel tubesheets. WM coolers have 316 grade stainless steel tubesheets and 90/10 Cu/Ni tubes, the ultimate in sea water compatibility.

Removable steel mounting brackets are supplied and can be adjusted for a range of mounting spacings.

End bonnets available in Single pass straight, Single pass 90° bend and Two pass. Refer to drawings.

WM251SSS
Single pass Marine Cooler
with straight end bonnets

WM252SSS
2 pass Marine Cooler

WM251SSN
Single pass Marine cooler
with a straight and a 90deg bonnet.

WI - PERFORMANCE - On road or off road torque converter and power shift transmissions

Note. Model WI with its high heat conversion surface, rugged construction and straight or 90° hose tail coolant connections is well suited for use with torque converter and power shift transmissions such as Allison, Clark and Funk etc. If the engine operational water flow exceeds 250 L/m, the WI unit must have a suitable parallel bypass fitted. Refer next page for engine water plumbing. Consult factory for special bypass components.

Allison Transmissions up to 275 engine HP.*
WT (World Transmission) Series MD 300 & B 300
Old models AT540, AT1540 and MT 600/300 Conv.
Use WI Oil Coolers selected by engine input HP.
WI151 max 120 HP, **WI251** max 180HP, **WI401** max 275HP.

FUNK Powershift up to 225 engine HP.*
400 Series. 1700 Series, 1000 Series
2000 Series, DF Series
Use WI Oil Coolers selected by engine input HP.
WI151 max 110 HP. **WI251** max 150HP, **WI401** max 225HP.

*Above selections are based on engine water entering cooler at 82°c (180°F) and oil entering at 143°c (290°F) using latent heat phase assuming steam thermal expansion characteristics.

W SERIES MATERIALS

Description	WM coolers (BLUE)	WI coolers (ORANGE)
Shell & Ports	Steel	Steel
Shell & Port finish	Zinc powder prime & powder coat	Zinc powder prime & powder coat
Tubes	90/10 Copper/Nickel	90/10 Copper/Nickel
Tubesheets	Stainless Steel	Steel
Baffles	Steel	Steel
Fins	Aluminium	Aluminium
Mounting Brackets	Zinc Plated Steel	Zinc Plated Steel
End Caps	Stainless Steel or Bronze	Zinc Plated Steel
Gaskets	Nitrile Rubber	Nitrile Rubber
Nameplate	Aluminium Foil	Aluminium Foil

Note:WM Coolers must be grounded to ships electrical earth system.

W SERIES RATINGS

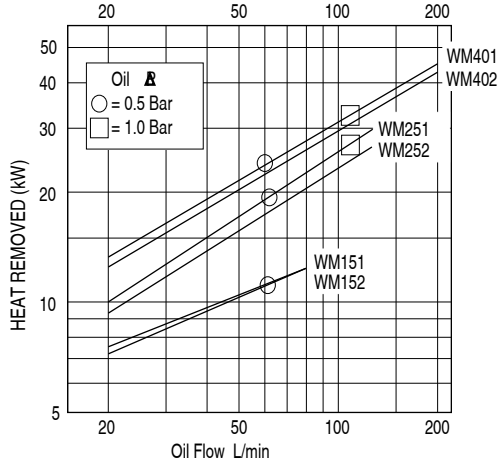
Maximum Flow Rates

Unit Size	Oil Side Litres/Min.	Water Side Litres/min. One Pass	Two Pass
W#15	80	170	80
W#25	130	170	80
W#40	200	170	80

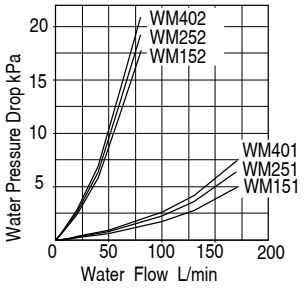
Ratings

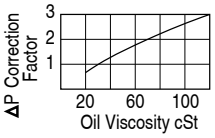
Maximum oil/shell side pressure ..... 26 Bar
Maximum water/tube side pressure..... 10 Bar
Maximum oil temperature.....150°C
Maximum viscosity ..... 80cSt actual

W SERIES PERFORMANCE



Performance curves are based on ISO 68 oil entering the cooler 40°C higher than the incoming water temperature used for cooling. This is also referred to as a 40°C entering temperature difference (ETD).
For single pass models Oil to Water flow ratio is 1:1
For two pass models Oil to Water flow ratio is 2:1.
DYNACOOL computer selection program is available to size units at other operating conditions.





ORDERING CODES

WI = INDUSTRIAL - 4" Shell with 1/4" Copper Nickel tubes, aluminium fins, steel tube plate.
WM = MARINE - 4" Shell with 1/4" Copper Nickel tubes, aluminium fins, 316SS tube sheet.

WM 15 1 S S S

COOLING STACK LENGTH
15 = 150mm - 3/4" BSPP Ports
25 = 250mm - 1" BSPP Ports
40 = 400mm - 1 1/2" BSPP Ports

NUMBER OF WATER SIDE PASSES
1 = Single pass, 2" hose tail and 1 1/4" BSPP
2 = Two pass, 1" BSPP

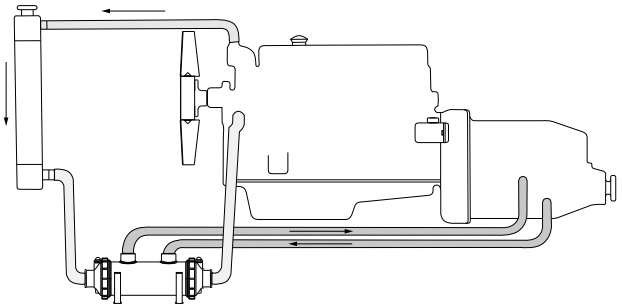
END BONNET MATERIALS
F = Steel - WI cooler as standard, available as 1 pass in straight or 90° and 2 pass.
S = Stainless - WM cooler. 1 pass in straight or 90° and 2 pass.
B = Bronze - WM cooler. 1 pass in straight only.

END BONNET COMBINATIONS
S = Straight.
N = 90° Elbow - SS316 only - single pass unit only - 2" hose tail.

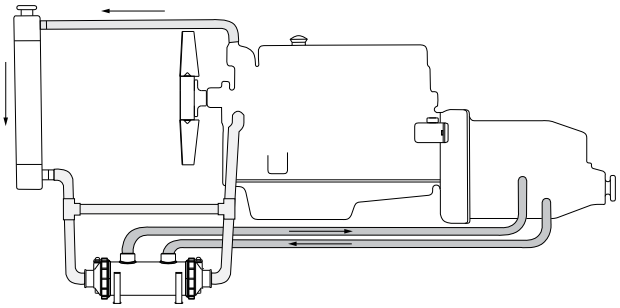
Replacement anode kits for WM series -73/01/05965.

WI COOLER - TRANSMISSION COOLING INSTALLATION

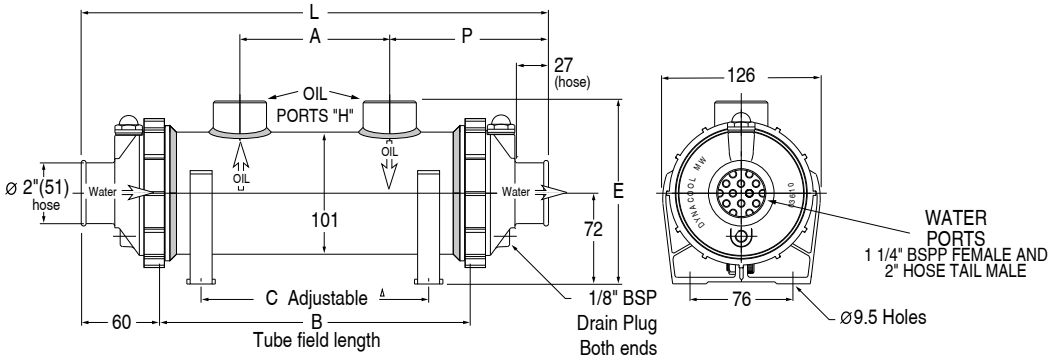
Without bypass water flow less than 250 L/m



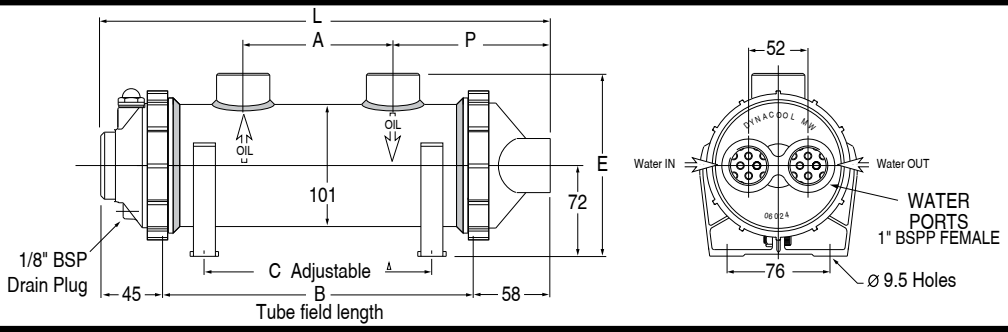
With bypass water flow exceeds 250 L/m



DIMENSIONS - W SERIES 1 PASS

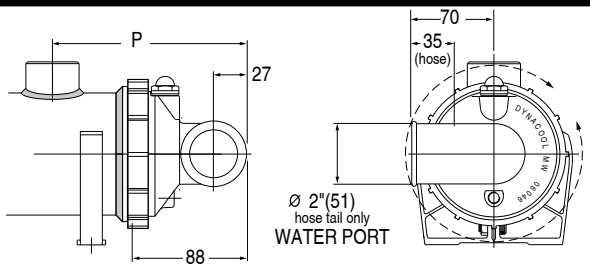


DIMENSIONS - W SERIES 2 PASS



DIMENSIONS - W SERIES 90° END BONNET

90Deg End Bonnet may be rotated to allow hose to be connected from any angle



May be field positioned around 360 deg to suit application.

COMMON DIMENSIONS						Single Pass Models			90° (Both ends)		Two Pass Models			Weight
Model	A	B	C Δ	E	H*		L	P	L^	P		L	P	kg
W#15	75	172	76	148	3/4”	**W#151**	291	108	348	136	**W#152**	275	106	5
W#25	125	272	190	148	1”	**W#251**	391	133	448	161	**W#252**	375	131	6
W#40	200	422	288	154	1 1/2”	**W#401**	542	171	598	199	**W#402**	525	169	9

* All ports are BSPP female pipe thread to ISO 228/1G Tolerance ± 3mm

^ Overall length for units that have 1x90° and 1xstraight bonnet is L - 28mm.

Δ Dimension C is factory preset. Mounting feet location may be adjusted to suit your application. Units may also be rotated and clamped allowing mounting in various positions e.g. -floor, wall or ceiling mounting.

TECHNICAL SPECIFICATIONS

Materials

Shell..... Copper
Tubes..... Copper/Nickel
Tubesheets..... Copper/Nickel
End Caps..... Bronze
Nameplate ..... Aluminium

Anode available. Part No. **WSANODE 1/8NPT**

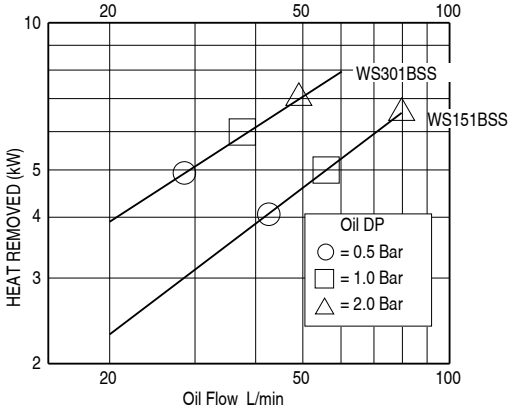
Ratings

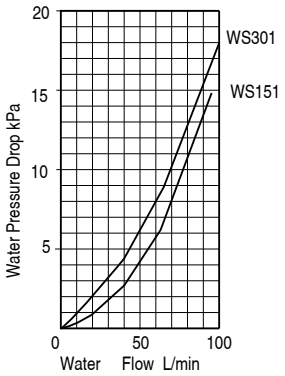
Maximum oil (shell) side pressure.....10 Bar
Maximum water (tube) side pressure .....10 Bar
Maximum temperature.....145°C

Maximum Flow Rates

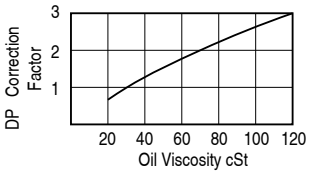
Unit Size	Shell Side l/min	Tube Side l/min
WS151	80	80
WS301	60	80

PERFORMANCE

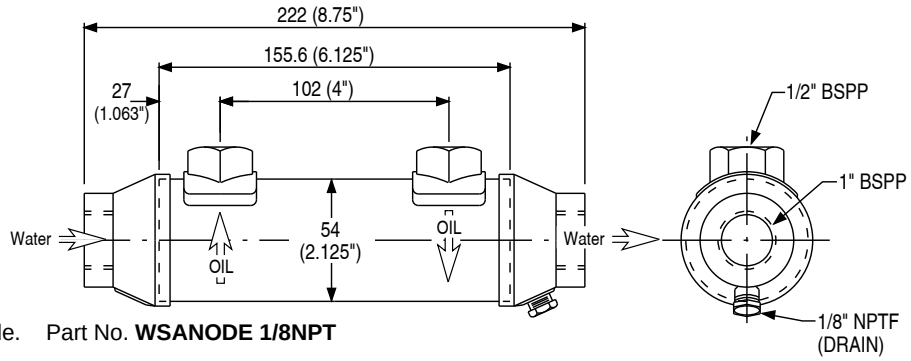




Performance curves are based on ISO 68 oil entering the cooler 40°C higher than the incoming water temperature used for cooling. This is also referred to as a 40°C entering temperature difference (ETD).
DYNACOOL computer selection program is available to size units at other operating conditions.

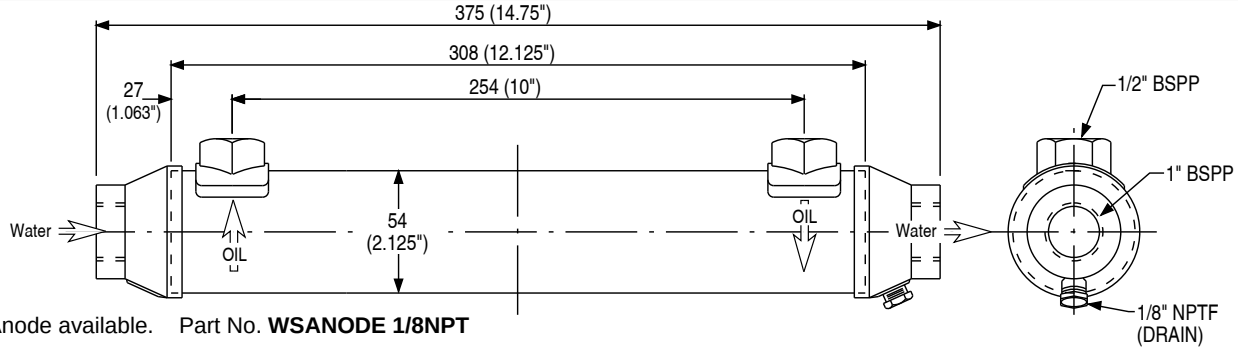


DIMENSIONS - WS151BBS WEIGHT 1.6KG



Anode available. Part No. **WSANODE 1/8NPT**

DIMENSIONS - WS301BBS WEIGHT 2.1KG



Anode available. Part No. **WSANODE 1/8NPT**

All dimensions in mm unless noted otherwise 0-50 are ± 1. 50-1500 are ± 3.