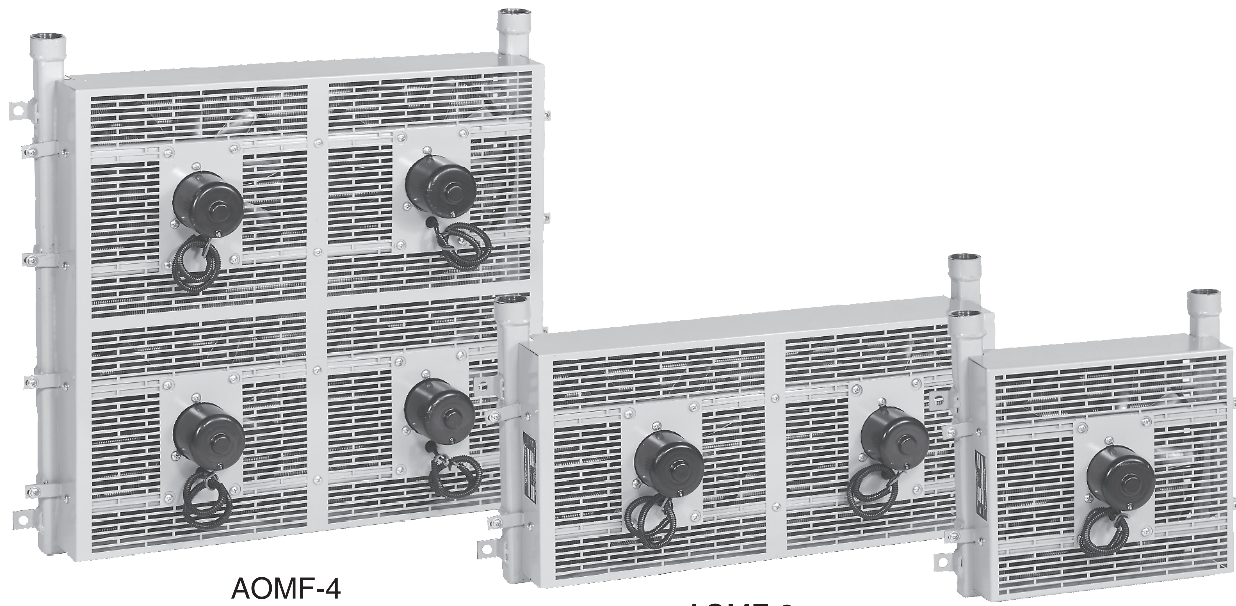
American Industrial
Heat Transfer Inc.
Manufacturer of Quality Heat Exchangers

AOMF SERIES



AOMF-4

AOMF-2

AOMF-1

MOBILE AIR COOLED

LIQUID COOLERS

12 volt & 24 volt DC motor

- Operating temperature of 300° F and pressure of 300PSI.
- Standard NPT or SAE connections.
- Cools: Fluid power systems, lubrication systems, hydraulic presses,gear drives, torque convertors, machine tools, etc...

SIZING
To properly size a DC fan drive air-cooled oil cooler for mobile equipment, you should first determine some basic parameters associated with the system.

HEAT LOAD
In many instances the heat load must be determined by using a "total potential" method. This total potential or horse power method is the most common method, and is the simplest way to determine basic heat rejection requirements for mobile hydraulic systems. The total potential us equal to the maximum operating flow and pressure that are generated by the system under full load. To determine the total potential (HP) use the following formula.

HP = [System Pressure (PSI) x System flow (GPM)] / 1714

Example:
HP = (3000 PSI x 40 GPM) / 1714 = 70 HP or the total input potential

To determine the system heat load in BTU / HR we must use a percentage *(v)* of the system potential HP. The factor *(v)* can be calculated by adding up the actual inefficiencies of a system; however, for most applications a *(v)* value of 25% - 30% can be used.

Example:
20 HP x .25 = 5 HP heat

To convert the horsepower of heat into BTU/HR use the formula below:
HP x 2542 = BTU/HR

Example:
5 HP x 2545 = 12,725 BTU/HR

Applying into a return line
For most open loop systems with a vane or gear type fixed delivery pumps. To calculate the Fs value required when applying the air/oil cooler into a return line use the formula below.

$$Fs = \frac{BTU/HR \times Cv}{T - t_{ambient}}$$

T = Desired system oil temperature leaving the cooler °F
$t_{ambient}$ = Ambient air temperature entering the cooler °F
Cv = Correction factor for oil viscosity. Example: ISO68 oil @ 150°F = 1.13 *(see chart)*

APPLYING INTO A CASE DRAIN LINE
In circumstances where the system is a closed loop or when return line flow is not available, the case drain flow can be utilized to help cool the system However, in many instances, the case drain flow alone will not be enough to reject all of the heat generated by the system. Case drain lines should not be treated as a normal return lines since the pressure drop allowable usually can vary from 12 - 10 PSI max. Check with your pump manufacturer for the appropriate pressure drop tolerance before applying any cooler. To size the system for case flow or case flow plus any additional flushing loops, please use the following method.

Formula

T = System temperature entering

Tc_{exit} = { T - [Q / (case flow gpm x 210)]}

Example

Tc_{exit} = { 150 - [12,725 / (8 x 210)]} = 142.4

Tc_{exit} = The corrected temperature of the oil exiting the cooler.

$$Fs = \frac{Q \times Cv}{Tc_{exit} - t_{ambient}} \qquad \frac{12{,}725 \times 1.13}{142.4-100} = 300\ Fs$$

SELECTION
To select a model, locate the flow rate (GPM) at the bottom of the flow vs Fs graph. Proceed upward until the GPM intersects with the calculated Fs. The curve closest above the intersection point will meet these conditions.
Examples:

Return Line	Case Line
Fs = 318	Fs = 300
GPM = 10 "return line flow"	GPM = 8
Model = AOMF - 2	Model = AOMF - 2

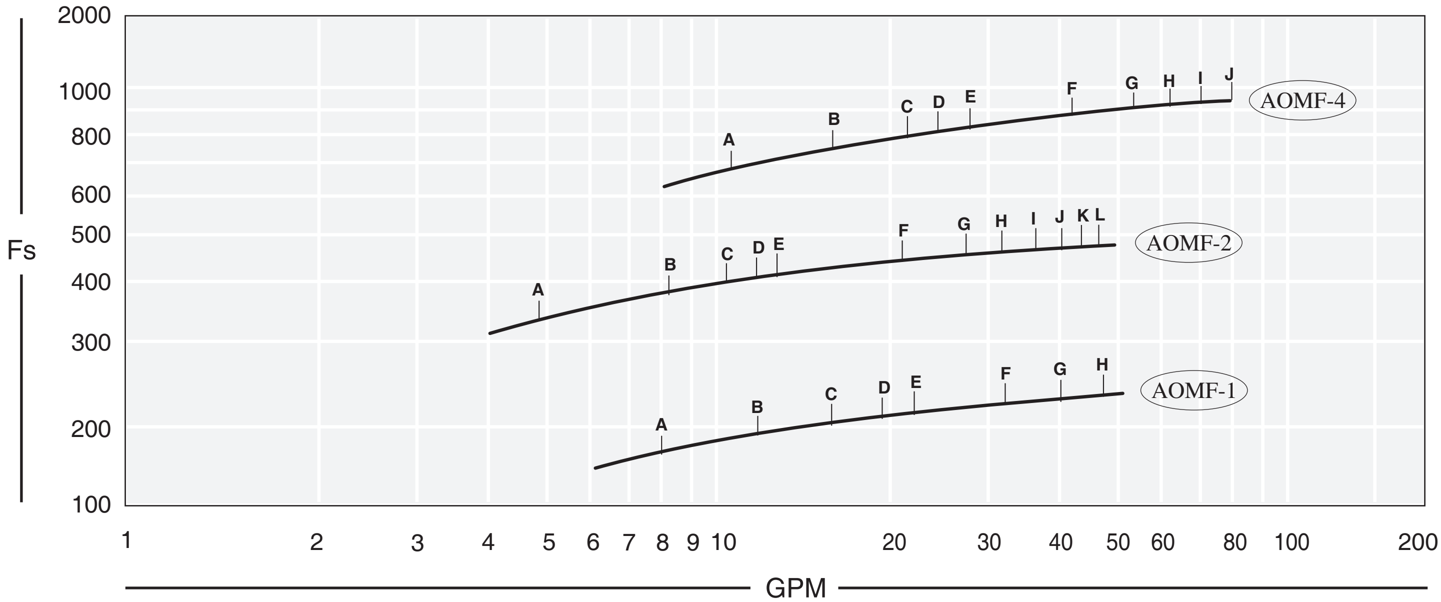
PRESSURE DROP
Determine the oil pressure drop from the curves as indicated. For viscosities other than 50 ssu, multiply the actual indicated pressure drop (psi) for your GPM by the value in the pressure differential curve for your viscosity value.

Examples:	GPM = 10	GPM = 8
Indicated pressure drop	2.9PSI	1.9 PSI
Cp correction factor for *ISO 68 oil @ 150°F*	3.72	2.47

Average Liquid Temperature	Cv VISCOSITY CORRECTION FACTORS																
	SAE 5	SAE 10	SAE 20	SAE 30	SAE 40	ISO 22	ISO 32	ISO 46	ISO 68	ISO 100	ISO 150	ISO 220	ISO 320	MIL-L-7808	POLYGLYCOL	PHOSPHATE ESTER	50% ETHYLENE GLYCOL & WATER
100	1.11	1.15	1.25	1.38	1.45	1.08	1.14	1.18	1.26	1.37	1.43	1.56	1.84	1.19	0.92	0.83	0.85
110	1.09	1.12	1.20	1.32	1.40	1.06	1.13	1.16	1.25	1.31	1.39	1.48	1.67	1.14	0.89	0.80	0.84
120	1.06	1.10	1.17	1.27	1.35	1.04	1.11	1.14	1.20	1.27	1.35	1.40	1.53	1.09	0.88	0.79	0.84
130	1.04	1.08	1.13	1.24	1.29	1.03	1.09	1.13	1.17	1.24	1.30	1.34	1.44	1.05	0.85	0.77	0.83
140	1.03	1.05	1.11	1.19	1.25	1.02	1.08	1.10	1.16	1.20	1.26	1.30	1.39	1.03	0.84	0.76	0.82
150	1.01	1.04	1.09	1.16	1.22	1.02	1.06	1.09	1.13	1.17	1.22	1.27	1.33	1.01	0.83	0.74	0.82
200	0.98	0.99	1.01	1.04	1.07	0.98	0.99	1.00	1.01	1.02	1.08	1.09	1.14	0.98	0.79	0.71	0.80
250	0.95	0.96	0.97	0.98	0.99	0.95	0.96	0.96	0.96	0.97	0.99	1.01	1.02	0.97	0.76	0.69	0.79

Average Liquid Temperature	Cp PRESSURE DROP CORRECTION FACTORS																
	SAE 5	SAE 10	SAE 20	SAE 30	SAE 40	ISO 22	ISO 32	ISO 46	ISO 68	ISO 100	ISO 150	ISO 220	ISO 320	MIL-L-7808	POLYGLYCOL	PHOSPHATE ESTER	50% ETHYLENE GLYCOL & WATER
100	2.00	2.40	4.40	6.40	8.80	1.07	1.53	1.82	2.54	4.19	6.44	9.38	13.56	1.26	3.00	3.50	0.730
110	1.70	2.10	3.60	5.10	6.70	1.04	1.45	1.72	2.35	3.73	5.70	8.33	11.63	1.20	2.40	2.90	0.720
120	1.50	1.80	3.00	4.20	5.60	1.02	1.38	1.60	2.15	3.26	4.91	7.23	9.73	1.14	2.10	2.50	0.709
130	1.40	1.60	2.60	3.40	4.50	0.99	1.30	1.49	1.94	2.80	4.14	6.19	7.80	1.08	1.90	2.20	0.698
140	1.30	1.50	2.23	2.90	3.70	0.97	1.23	1.38	1.75	2.38	3.47	5.20	6.11	1.03	1.90	2.00	0.686
150	1.20	1.30	1.90	2.50	3.10	0.95	1.17	1.30	1.61	2.04	2.90	4.35	4.77	0.98	1.70	1.90	0.676
200	0.93	0.96	1.20	1.40	1.60	0.89	0.99	1.08	1.18	1.33	1.59	1.74	1.95	0.90	1.20	1.30	0.635
250	0.81	0.82	0.92	0.97	1.05	0.85	0.93	0.96	1.03	1.11	1.21	1.22	1.23	0.83	1.00	1.05	0.556

AOMF SERIES



PERFORMANCE CALCULATION	OIL PRESSURE DROP (PSI) CODE			
$F_s = \frac{\text{Horsepower to be removed (HP) x 2545 x Cv}}{\text{°F (Oil Leaving* - Ambient Air Entering)}} = \frac{\text{BTU}}{\text{hr °F}}$	A = 1 PSI B = 2 PSI C = 3 PSI	D = 4 PSI E = 5 PSI F = 10 PSI	G = 15 PSI H = 20 PSI I = 25 PSI	J = 30 PSI K = 35 PSI L = 40 PSI

*Represents desired fluid leaving the cooler.

AOMF ELECTRIC MOTOR DATA

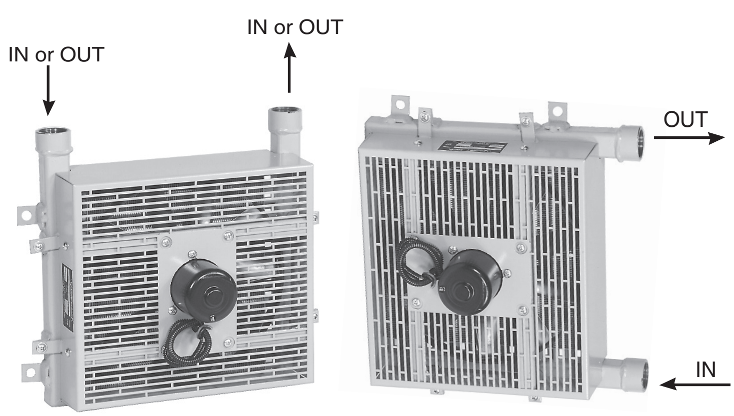
Model	Air Flow	No. of Motors	Volts	RPM	Per Motor Full Load Amperes
AOMF - 1	950	1	12V / 24V	2700	9 / 4.5
AOMF - 2	1900	2	12V / 24V	2700	9 / 4.5
AOMF - 4	3900	4	12V / 24V	2700	9 / 4.5

STANDARD CONSTRUCTION MATERIALS

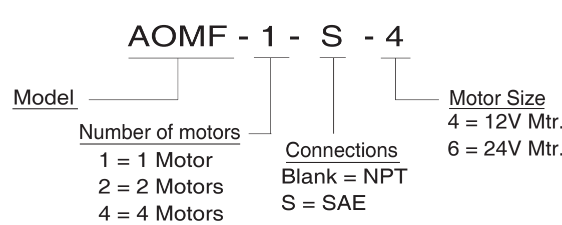
Standard Construction Materials			
Tubes	Copper	Mount. bracket	Steel
Fins	Aluminum	Cabinet	Steel
Turbulators	Steel	Fan Blade	Aluminum
Manifold	Steel		

Standard Unit Ratings	
Operating Pressure	300 psig
Operating Temp.	300 °F

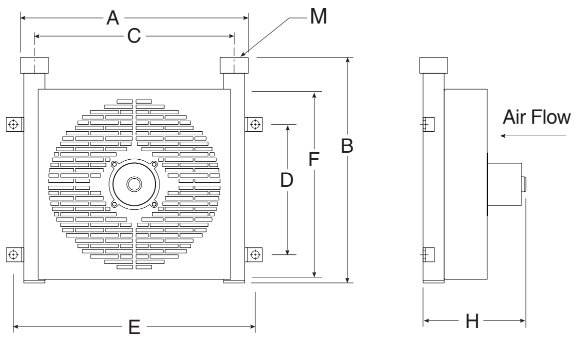
PIPING HOOK UP



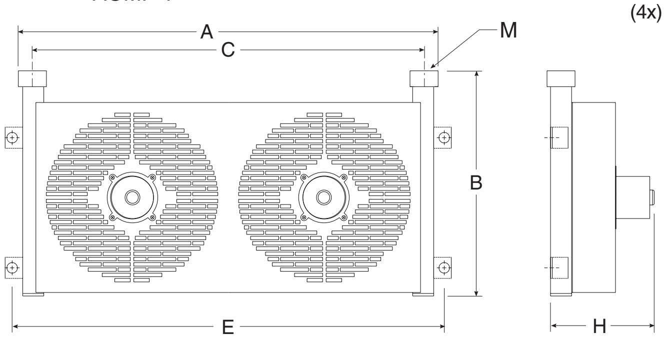
EXAMPLE OF A MODEL



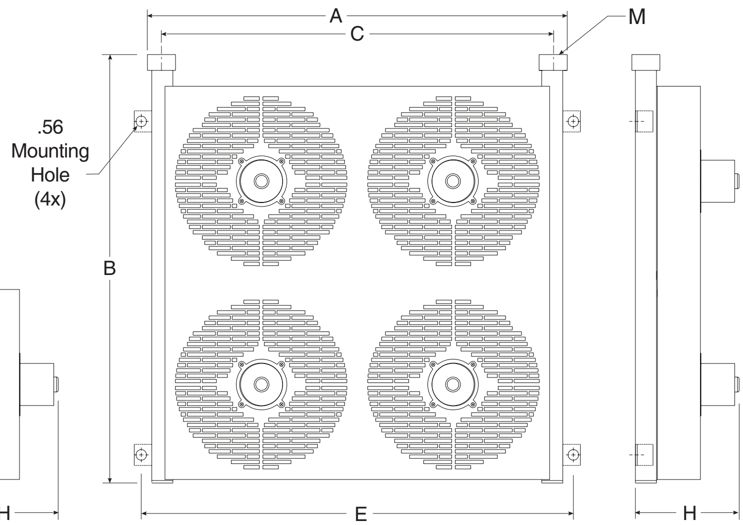
AOMF Series *dimensions*



AOMF-1



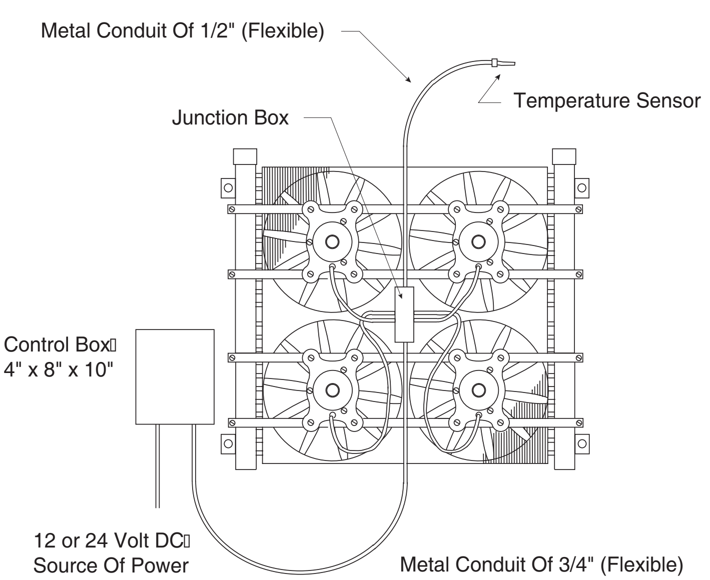
AOMF-2



AOMF-4

DIMENSIONS (inches)												
Model	A	B	C	D	E	F	G	H	M NPT	M SAE	Weight	Model
AOMF - 1	15.72	16.00	14.22	9.25	17.22	13.00	11.00	7.75	1.25	#20 SAE 1 5/8 -12	41.00	AOMF - 1
AOMF - 2	29.63	16.00	28.88	9.25	30.75	13.00	24.75	7.75	1.25		69.00	AOMF - 2
AOMF - 4	29.63	29.00	27.88	23.25	30.75	26.00	24.75	7.75	1.25		109.00	AOMF - 4

INSTALLATION DIAGRAM



NOTE: Electrical Equipment Not Included. It Is Shown Here For Proper Installation.

CONTROL BOX CIRCUIT