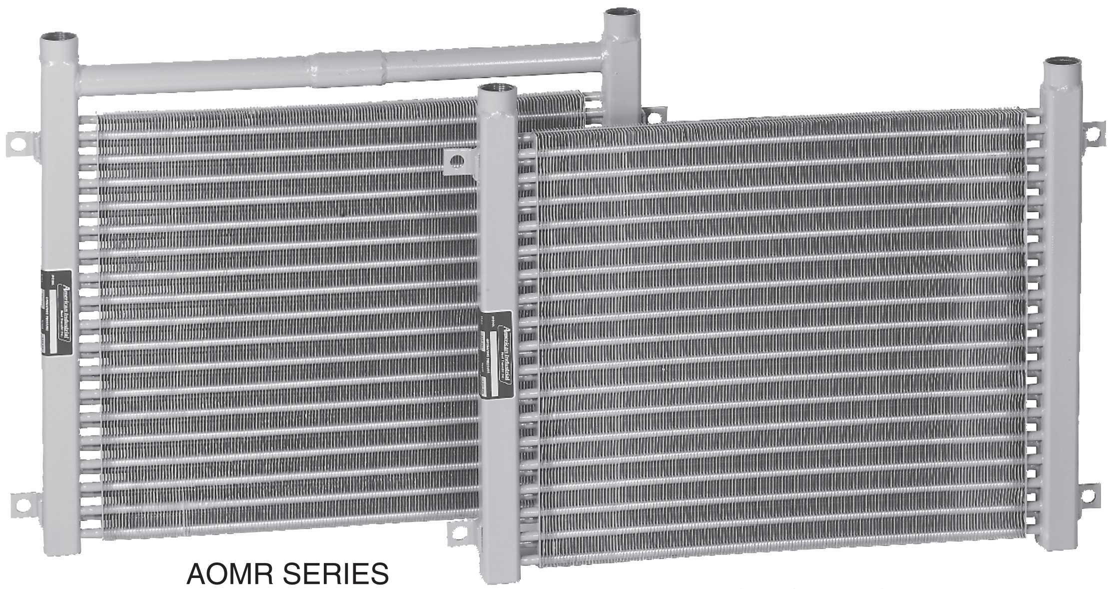
American Industrial
Heat Transfer Inc.
Manufacturer of Quality Heat Exchangers



AOMR SERIES
with by-pass relief valve

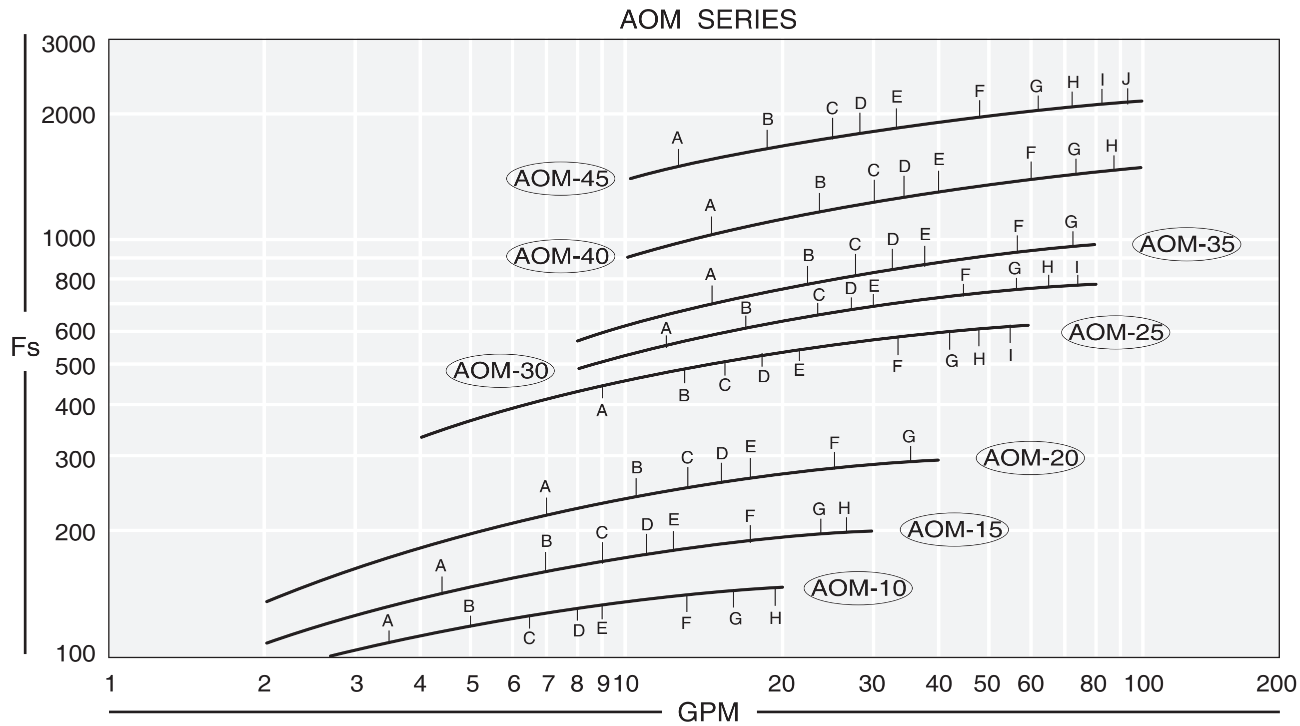
AOM SERIES

AIR COOLED MOBILE

LIQUID COOLERS

- Operating temperature of 300°F.
- Operating pressure 300PSI.
- For mobile applications
- Standard NPT or SAE connections.
- Optional 30 PSI or 65 PSI bypass relief valve.
- Can be customized to fit any applications.

AOM & AOMR Series *selection*



SELECTION GUIDE
The performance curves are based on 50 sus oil & 1000 Standard Feet Per Minute air velocity. If your air velocity is other than 1000 SFPM, please use the correction curve located on this page before choosing a model.

SIZING
To properly size a AOM air-cooled oil cooler for mobile equipment, first determine some basic parameters associated with your system.

HEAT LOAD
In many instances the heat load must be determined by using the following method. The 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 is 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 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:
70 HP x .25 = 17.5 HP heat

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

Example:
17.5 HP x 2545 = 44,538 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: ISO32 oil @ 150°F = 1.06

APPLYING INTO A CASE DRAIN LINE
In circumstances where the system is 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 2 - 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 fluching loops, please use the following method.

Formula

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

Example

Tc_{exit} = { 150 - [44,538 / (10 x 210)]} = 128.8

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

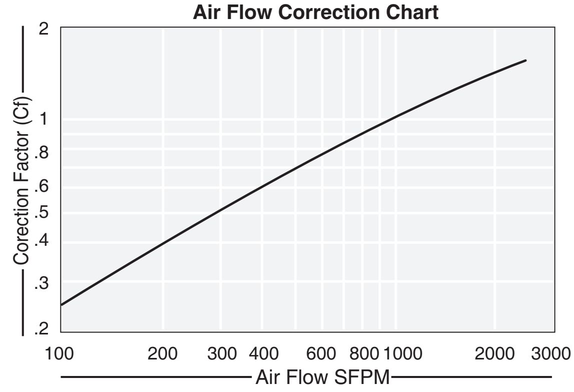
$$Fs = \frac{Q \times Cv}{Tc_{exit} - t_{ambient}} \qquad \frac{44{,}538 \times 1.06}{128.8-100} = 1{,}639$$

CORRECTING FOR ALTERNATE AIR VELOCITY
If your air velocity is other than 1000SFPM, you must correct to achieve the proper capacity required.

Formula : CFs = Fs / Cf *see chart*

	Example 1	Example 2
Air velocity	500 SFPM	1800 SFPM
CFs =	944 Fs / .68 Cf = 1,388	1,639 / 1.35 = 1,214

Air Flow Correction Chart



SELECTION

To select a model, locate the flow rate (GPM) through the cooler 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 = 1,388	Fs = 1,214
	GPM = 40 "return line flow"	GPM = 10
	Model = AOM - 45	Model = AOM - 45

PRESSURE DROP

Determine the oil pressure drop from the curves as indicated. For viscosities other than 50 sus at operating, multiply the actual indicated pressure drop (psi) for your GPM by the value in the pressure differential chart for your viscosity.

Examples:	GPM = 40	GPM = 10
Indicated pressure drop	5 PSI	1 PSI
Cp correction factor for *ISO 32 oil @ 150°F*	1.17	1.17

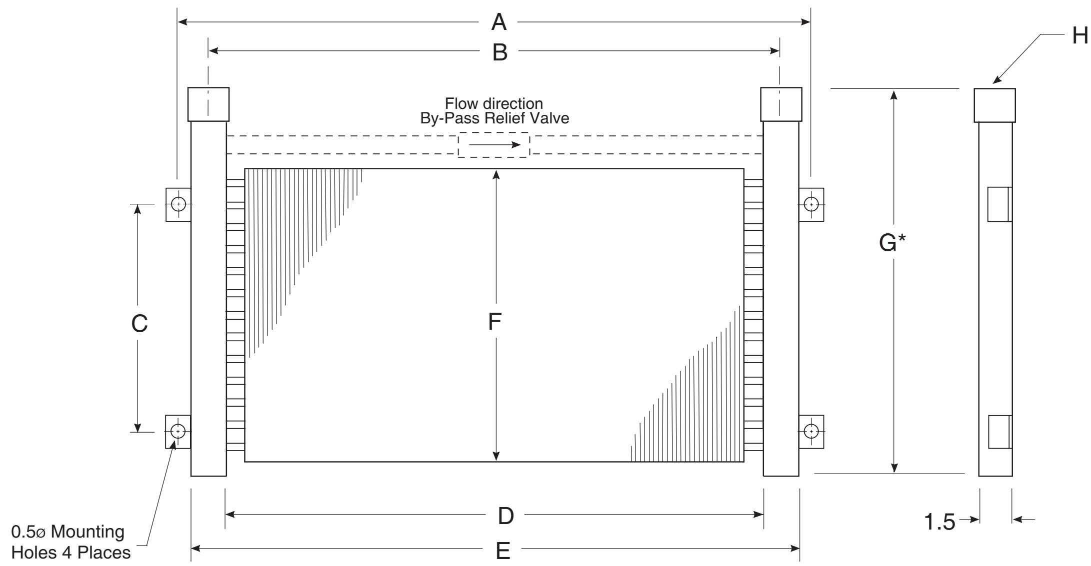
PERFORMANCE CALCULATION

$$F_s = \frac{\text{Horsepower to be removed (HP) x 2545 x Cv}}{\text{°F (Oil Leaving* - Ambient Air Entering)}} = \frac{\text{BTU}}{\text{hr °F}}$$

*Represents desired fluid leaving the cooler.

OIL PRESSURE DROP (PSI) CODE

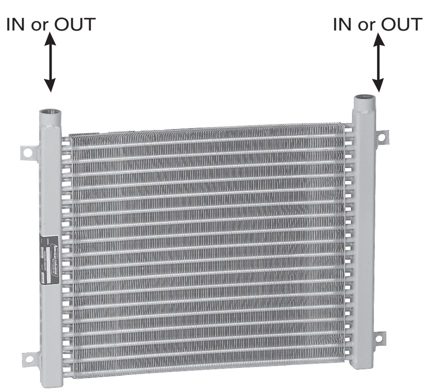
A = 1 PSI	D = 4 PSI	G = 15 PSI	J = 30 PSI
B = 2 PSI	E = 5 PSI	H = 20 PSI	
C = 3 PSI	F = 10 PSI	I = 25 PSI	

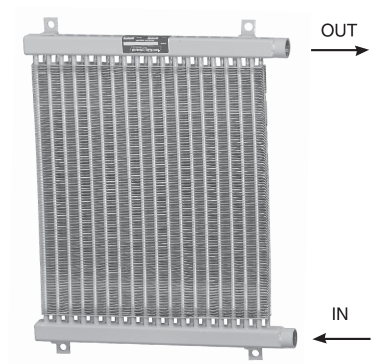


AOM & AOMR DIMENSIONS & WEIGHTS

STANDARD DIMENSIONS (inches)

Model	A	B	C	D	E	F	G AOM	G AOMR	H NPT	H SAE	Face Area	Weight LBS
AOM & AOMR-10-#	19.72	16.72	3.50	14.50	18.22	6.00	8.62	10.06	1.00	16 SAE 1-5/16-12 UN-2B	.60	20
AOM & AOMR-15-#	19.72	16.72	5.50	14.50	18.22	8.00	10.62	12.06	1.00		.81	25
AOM & AOMR-20-#	19.72	16.72	9.50	14.50	18.22	12.00	14.62	16.06	1.00		1.21	35
AOM & AOMR-25-#	25.72	22.72	15.50	20.50	24.22	18.00	20.62	22.06	1.00		2.56	40
AOM & AOMR-30-#	24.72	21.72	21.50	19.50	23.22	24.00	26.56	28.06	1.25	20 SAE 1-5/8-12 UN-2B	3.25	45
AOM & AOMR-35-#	24.72	21.72	27.50	19.50	23.22	30.00	32.56	34.06	1.25		1.06	55
AOM & AOMR-40-#	30.22	27.22	33.50	25.00	28.72	36.00	38.31	40.38	1.25		6.25	65
AOM & AOMR-45-#	40.72	37.72	33.50	35.50	39.22	36.00	38.31	40.38	1.25		8.88	75





EXAMPLE OF A MODEL

AOM - 25 - N

- Model
- Size
- Connections: N = NPT, S = SAE

AOMR - 25 - S - R - 65

- Model
- Size
- Connections: N = NPT, S = SAE
- Relief Valve
- PSI Relief: 30 = 30psi, 65 = 65psi