American Industrial
Heat Transfer Inc.

Manufacturers of Quality Heat Exchangers
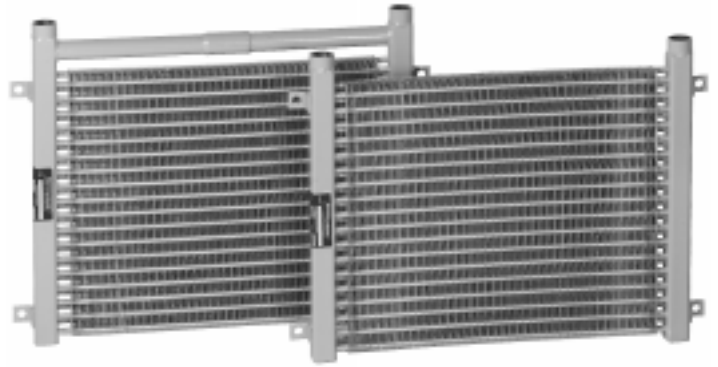
BM - 131 thru BM - 142 SERIES

AOMR SERIES
with by-pass relief valve

AOM SERIES

BM - 201 thru BM - 322 SERIES

BM - 101 & BM - 102 SERIES

Visit our web site at *www.aihti.com*

AIR COOLED
OIL COOLERS

BM - Series

- Mounts directly to TEFC electric motor.
- Fits NEMA frame sizes 48 through 365.
- Standard NPT or SAE connections.
- Core guard & mounting brackets included.
- Operating temperature of 400°F & pressure of 300PSI.
- Cools case drains, hydraulic presses, bearings gear boxes, hydraulic tools, etc…

AOM - Series

- Rugged construction.
- Standard NPT, SAE or 37°flare connections.
- Optional high-quality bypass relief valve.
- Operating temperature of 400°F & pressure of 300PSI.
- Can be customized to fit your needs.
- Cools: case drains, hydraulic presses, bearings gear boxes, hydraulic tools, etc…

INTRODUCTION
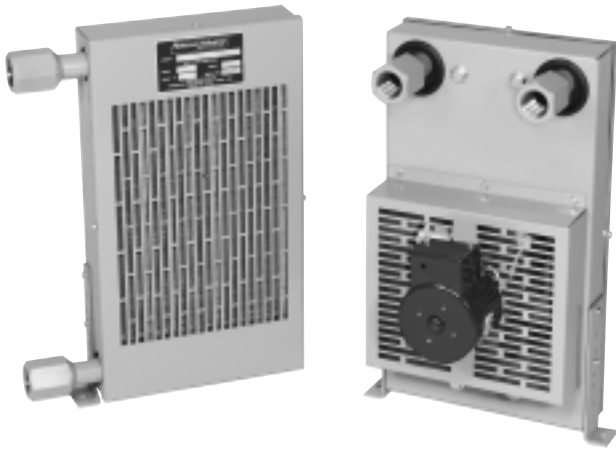
BM-131 Thru BM-142

Attractive, compact, efficient fan cooled air/oil cooler designed for small heat removal requirements. Commonly used for CNC machining centers, presses, pump & motor case drains, lubrications systems, etc…

Offered with a single-phase 1/40th horsepower electric motor.

BM-101 & BM-102

Compact air/oil heat exchanger made to mount on the fan side of a totally enclosed fan cooled electric motor. Uses the air flow from the electric motor the cool the oil. Normally applied to removed up to 1 horsepower of the heat.
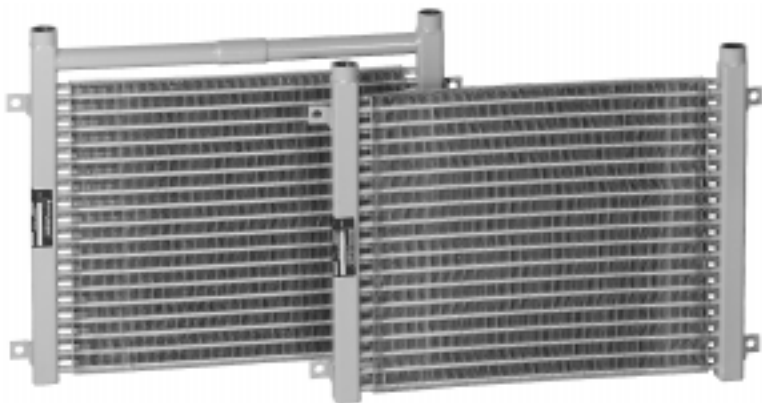
Flow capacity up to 23 GPM. Accepts NEMA frame sizes from 48 to 184.

BM-201 Thru BM-322

Air/oil cooler mounts to the fan side of a totally enclosed fan cooled electric motor. Uses the air flow from the electric motor to cool the oil.

Flow capacity up to 25 GPM. Heat removal capacity to 3.6 horsepower. Accepts NEMA frame sizes from 213 to 365.

AOM & AOMR SERIES

Air-cooled mobile oil cooler, designed to cool transmission oil, ethylene glycol, etc… Normally used in front of a radiator or anywhere there is an air source available.

Eight standard sizes are available with NPT or SAE connections and flow rates to 75 GPM.

SIZING

To properly size a BM TEFC Motor air-cooled oil cooler for industrial equipment, you should first determine some basic parameters associated with your 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 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. Note: If the electric motor horsepower of the system prime mover is known, use it as your system potential.

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

Examples:
(1) 7.5 HP 254T frame electric motor driving a pump = 7.50 HP potential
(1) HP = (1250 PSI x 10 GPM) / 1714 = 7.30 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: 7.50 HP x .30 = 2.25 HP heat

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

Example: 2.25 HP Heat x 2545 = 5,729 BTU/HR

Applying into a return line

For most open loop systems with 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:

$$Fs = \frac{BTU/ HR \times Cv}{T - t_{ambient}} \quad \text{Example} = \frac{5729 \times 1.08}{140 - 90} = 123.7 \text{ Fs}$$

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 @140°F = 1.08 *(see chart)*

APPLYING INTO A CASE 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 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 flushing loops, please use the following method. Closed loop case drain operating temperatures are normally higher than open loop circuit return line temperatures.

Formula
Tc $_{exit}$ = { T - [Q / (case flow gpm x 210)]}

Example
Tc $_{exit}$ = { 155 - [5,729 / (3 x 210)]} = 145.9

Tc $_{exit}$ = The corrected temperature of the oil exiting the cooler.

$$Fs = \frac{Q \times Cv}{Tc_{exit} - t_{ambient}} \qquad \frac{5,729 \times 1.08}{145.9 - 90} = 101.6$$

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 Drain
Fs = 123.7	Fs = 101.6
GPM = 10 "return line flow"	GPM = 3.0
Motor size = 324 frame	Motor size = 254T frame
Model = BM - 321	Model = BM - 302

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 = 10	GPM = 3
Indicated pressure drop	1.4 PSI	1 PSI
Cp correction factor for *ISO 32 oil @ 140°F*	1.23	1.23
Pressure drop correction	1.4x1.23 = 1.72 psi	1.0x1.23 = 1.23 psi

AIR FLOW CORRECTION CHART

In some instances our units are applied to motors or application where additional or less air flow is available than the flows used for our performance curves. In these instances you can use our air flow correction curves to determine if one of the existing models will work for your application.
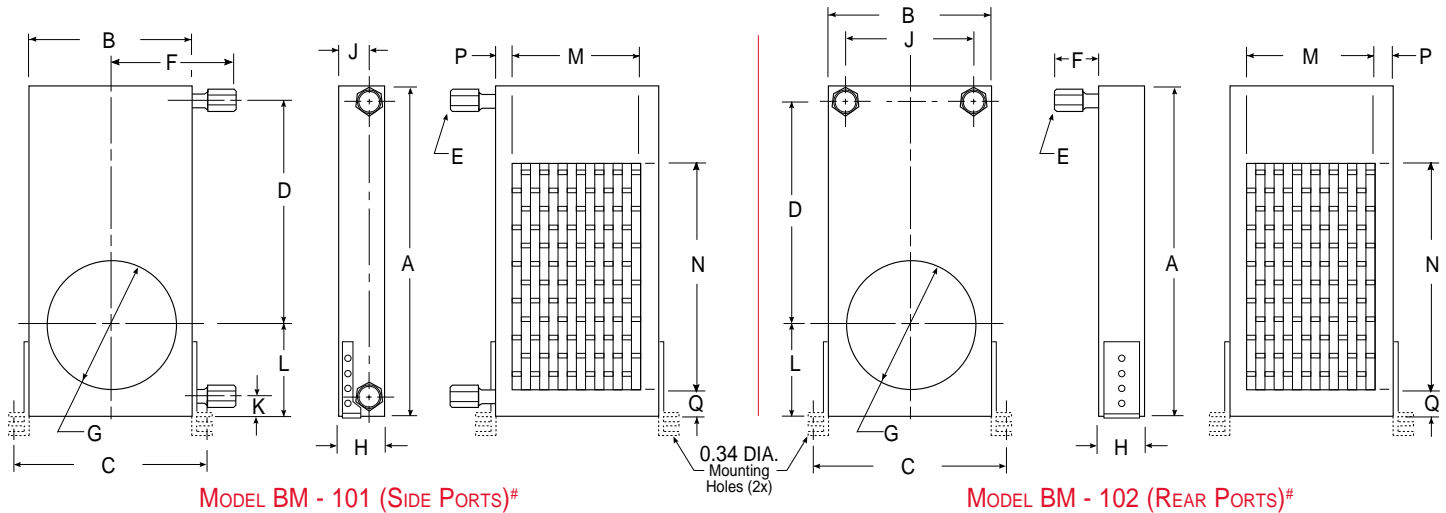
Example:
Follow the preceding examples to properly determine your required Fs. Use the following formula to correct for the difference in air-flow rate. If the calculated Fs = 123.7 and the electric motor were a 1800 rpm 326 frame motor with 250 cfm of air flow, correct as shown. Select the correction factor Cf only from the curve that matches to your electric motor frame size properly. Note: Using a unit that is to small may damage your electric motor due to lack adequate of air flow.

Formula	Example
Fs x C*f* = CFs (corrected)	CFs = 123.7 x 1.50 (from curve) = 185.6 CFs

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	POLY-GLYCOL	PHOS-PHATE ESTER	50% ETHY-LENE 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	POLY-GLYCOL	PHOS-PHATE ESTER	50% ETHY-LENE 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	

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BM SERIES

PERFORMANCE CALCULATION

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

*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	K = 35 PSI
C = 3 PSI	F = 10 PSI	I = 25 PSI	L = 40 PSI

Note: Performance curves are based upon petroleum oil at 50 sus. For average oil viscosities other than 50 sus, use the correction factors Cv & Cp located on page 3. If the above models can not meet your cooling needs, please refer to our fan cooled models.

STANDARD CONSTRUCTION MATERIALS

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

Standard Unit Ratings	
Operating Pressure	300 psig
Test Pressure	450 psig
Operating Temp.	400 °F

Air Flow Correction Chart

ELECTRIC MOTOR NEMA FRAME SIZES

Curve A	Curve B		Curve C
48 - 184	213 - 256	254 - 286	324 - 365
BM - 101	BM - 201	BM - 301	BM - 321
BM - 102	BM - 202	BM - 302	BM - 322

EXAMPLE OF A MODEL

BM - 302 - S

Series ——

Model
101 , 102
201 , 201
301 , 302
321 , 322

Connections
N = NPT
S = SAE

Use the following formula to correct for airflow rates for the given curves A,B, or C (as it is shown in the above dotted line graph).

Formula	Example
Fs x C*f* = CFs (corrected Fs)	123.7 x 1.50 (from curve) = 185.6 CFs

MODEL BM - 101 (SIDE PORTS)#

0.34 DIA.
Mounting
Holes (2x)

MODEL BM - 102 (REAR PORTS)#

STANDARD DIMENSIONS (inches)

Model	A	B	C	D	E NPT	F	G Dia.	H	J	K	L	M	N	P	Q	Weight LBS
BM - 101	15.75	9.00	10.25	8.50	.75	7.75	7.00	2.22	.94	1.13	5.88	7.50	10.50	0.75	2.31	14.50
BM - 102	15.75	9.00	10.25	8.50	.75	2.69	7.00	2.22	6.00	–	5.88	7.50	10.50	0.75	2.31	14.50
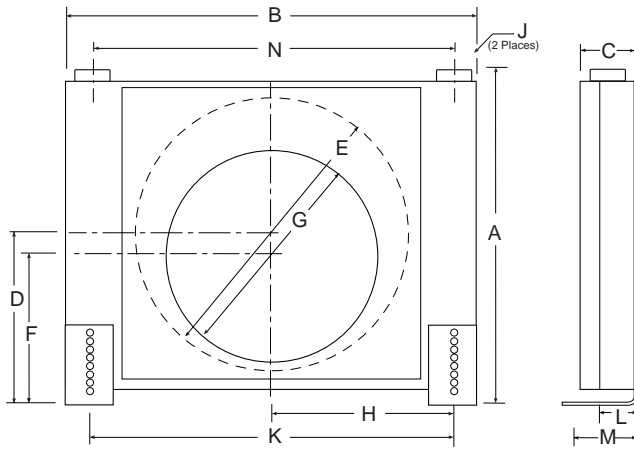
MODELS BM-201, 301, 321 (SINGLE PASS)
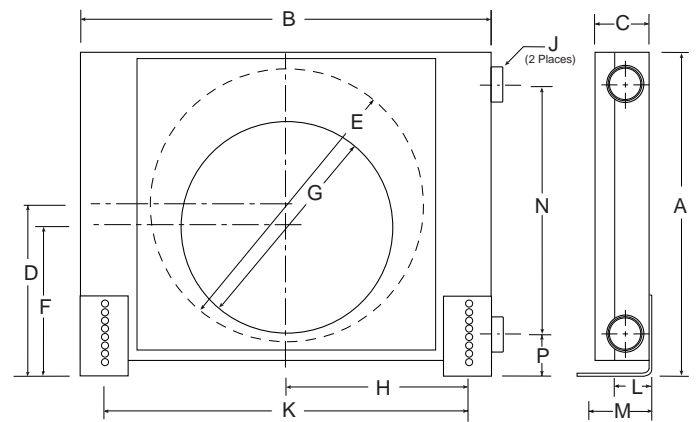
MODELS BM-202, 302, 322 (TWO PAS)

STANDARD DIMENSIONS (inches)

Model	A	B	C	D	E Dia.	F	G Dia.	H	J NPT	J SAE	K	L	M	N	P	Weight LBS
BM - 201	14.90	16.50	2.75	7.33	12.62	5.13	8.00	7.38	.75	#12	14.75	.50	1.94	14.62	–	14
BM - 202	13.75	16.50	2.75	7.33	12.62	5.13	8.00	7.38	.75	#12	14.75	.50	1.94	8.00	3.19	14
BM - 301	19.50	24.80	2.75	9.75	14.62	8.19	12.00	10.72	.75	#12	21.44	.88	3.38	22.88	–	30
BM - 302	18.69	24.80	2.75	9.75	14.62	8.19	12.00	10.72	.75	#12	21.44	.88	3.38	14.00	2.62	30
BM - 321	19.50	24.80	2.75	9.75	17.00	9.75	14.62	10.72	.75	#12	21.44	.88	3.38	22.88	–	30
BM - 322	18.69	24.80	2.75	9.75	17.00	9.75	14.62	10.72	.75	#12	21.44	.88	3.38	14.00	2.62	30

PIPING HOOK-UP

IN or OUT

IN or OUT

OUT

IN

Adjustable
brackets
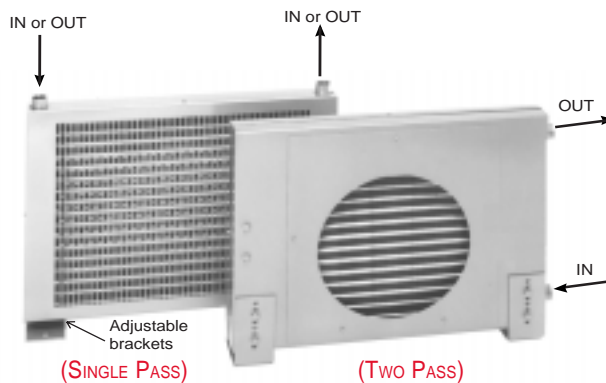
(SINGLE PASS)

(TWO PASS)

NOTE:

To obtain the best performance place the opening of the unit against the fan air intake of the motor. Use a gasket or calking compound around the joint to prevent air from leaking out from around the edges.

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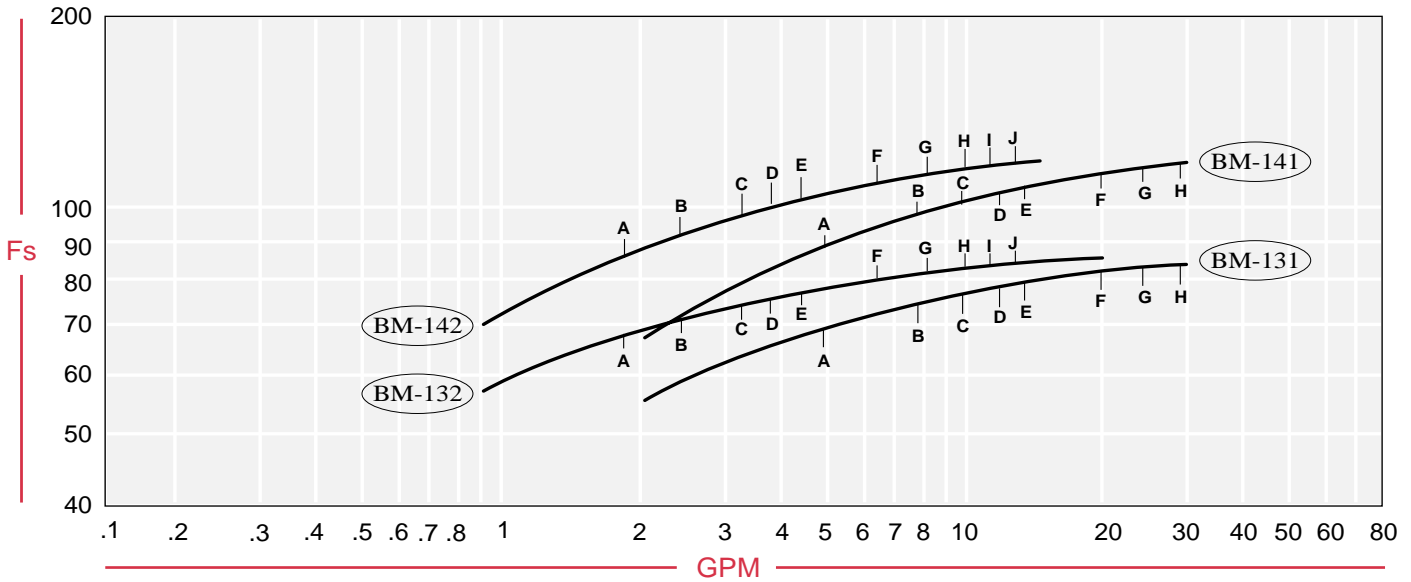
PERFORMANCE CALCULATION		OIL PRESSURE DROP (PSI) CODE			
$F_s = \dfrac{\text{Horsepower to be removed (HP) x 2545 x Cv}}{°F \text{ (Oil Leaving* - Ambient Air Entering)}} = \dfrac{BTU}{hr\ °F}$		A = 1 PSI	D = 4 PSI	G = 15 PSI	J = 30 PSI
		B = 2 PSI	E = 5 PSI	H = 20 PSI	K = 35 PSI
		C = 3 PSI	F = 10 PSI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

✱Represents desired fluid leaving the cooler.

Sizing

The performance curves provided are for petroleum oil at 50 ssu viscosity. However, fluids with characteristics other than the above mentioned may be used by applying a correction factor.

Heat Load

If the heat load is unknown, a horsepower value can be calculated by first determining the systems total potential. For a basic hydraulic system, it is helpful to know whether the system is open loop (with a large reservoir) or closed loop (normally on mobile equipment, with a very small reservoir). System potentials may be calculated quickly by using one of the two methods below.

There are some system parameters that will be required to properly accomplish the sizing calculations. Without system parameters it is difficult to determine the optimal heat exchanger size. Normally many of the system parameters can be found on hydraulic schematics or on tags located on the actual equipment. Follow are some basic parameters that you should try to acquire before attempting the sizing calculations. However, it is not necessary to have every parameter listed below.

- Main system flow rate (gpm) & operating pressure (psi).
- Electric motor HP driving hydraulic pump (if more than one add up the Hp for all).
- Desired temperature (°F).
- Fluid type (SAE 10, 20, 30, etc....).
- Ambient air temperature (warmest day).
- Desired fan drive (hydraulic, electric, 12-24V DC, etc...).
- BTU's or HP to be cooled (normally given for lubrication systems).
- Maximum pressure drop allowed through the heat exchanger.
- Space available for heat exchanger (LxWxH).
- External air condition (dirty, papers,etc.)

Method 1

Normally used for open loop circuits. Multiply the main hydraulic systems Electric Motor Name plate Horsepower by a heat removal factor (normally 30-50%).

Example: 5 HP motor x .25 = 1.25 HP heat load

Method 2

Normally used when the HP input potential is unknown or for mobile applications where diesel engines operate the entire system.

Multiply system pressure by the flow rate of the main system divided by 1714 equals system potential (HP). Multiply the system HP by a heat removal factor (Normally 25-35%). Note: In some closed loop systems only a portion of the total system flow is directed through the heat exchanger, this may affect the cooler selection process substantially. You may contact our factory for additional technical assistance.

Example: $\dfrac{(1700\ psi \times 5\ gpm)}{1714}$ = [5 HP x .25] = 1.25 HP heat load

Determining Fs value

To determine the proper size heat exchanger for your application, use the following equation to first determine the (Fs) factor.

$$Fs = \frac{\{\text{heat load (HP) x 2545 x Cv}\}}{\{°F \text{ (oil leaving - air entering)}\}}$$

Example:
Heat load = 1.25 HP
Cv = 1.11 (SAE 20) determined from chart. [Located on page 3.]
Desired operating temperature = 10 °F
Ambient air temp. = 100 °F

$$Fs = \frac{\{1.25 \times 2545 \times 1.11\}}{\{140\ °F - 100\ °F\}} = 88.3$$

Selection

To select a model, locate the flow rate (GPM) at the bottom of the flow vs Fs graph (on page 4). Proceed upward until the GPM flow rate intersects with the calculated Fs. The curve closest above the intersection point will meet these conditions.

Example: Fs = 88.3 = Model = BM-141
   **GPM = 5**

Pressure differentials

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

Example: Model 141 @ 5 gpm & 50 ssu -curve-
        Indicated pressure drop 1 psi (Approx)
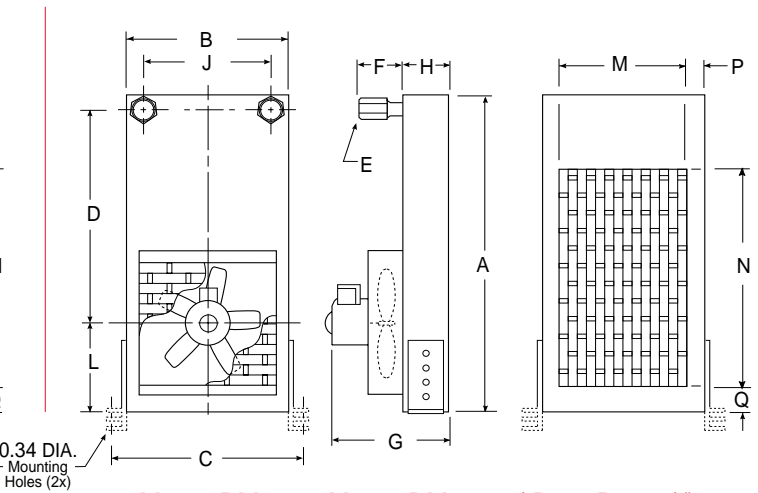   { 1 psi x 2.23Cp (for SAE-20 oil,page 3) } = 2.23 corrected psi

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BM-131 Thru BM-141
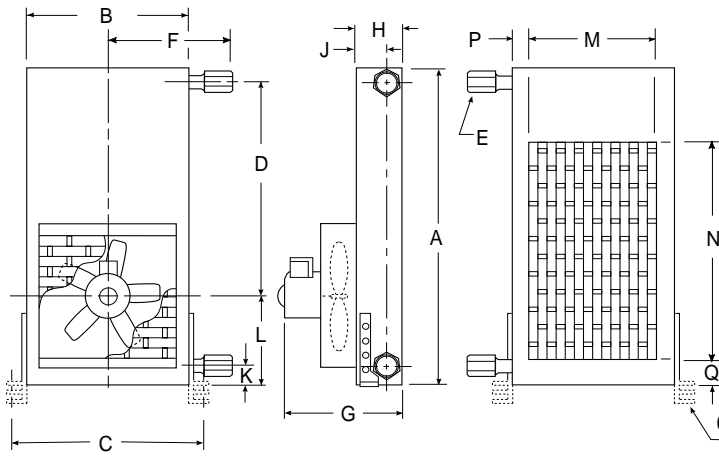
MODEL BM-131, MODEL BM-141 (SIDE PORTS)#   MODEL BM-132, MODEL BM-142 (BACK PORTS)#

STANDARD DIMENSIONS (inches)

Model	A	B	C	D	E NPT	F	G	H	J	K	L	M	N	P	Q	Weight LBS
BM - 131				14.38		7.75			.94	1.13						
BM - 141	9.00	15.75	10.25	8.50	.75	2.69	8.00	2.22	6.00	–	5.88	7.50	10.50	0.75	2.31	18.50
BM - 132				14.38		7.75			.94	1.13						
BM - 142				8.50		2.69			6.00	–						

STANDARD CONSTRUCTION MATERIALS

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

Standard Unit Ratings	
Operating Pressure	300 psig
Test Pressure	450 psig
Operating Temp.	400 °F

ELECTRIC MOTOR DATA

Model	Horse Power	Phase	Hz	Volts	RPM	Enclosure Type	Full Load Amperes	Thermal Overload
BM - 131	1 / 40	1	60	115	1550	T.E.A.O.	1.1	AUTO
BM - 132	1 / 40	1	60	115	1550	T.E.A.O.	1.1	AUTO
BM - 141	1 / 40	1	60	115	3000	T.E.A.O.	1.12	AUTO
BM - 142	1 / 40	1	60	115	3000	T.E.A.O.	1.12	AUTO

PIPING HOOK UP
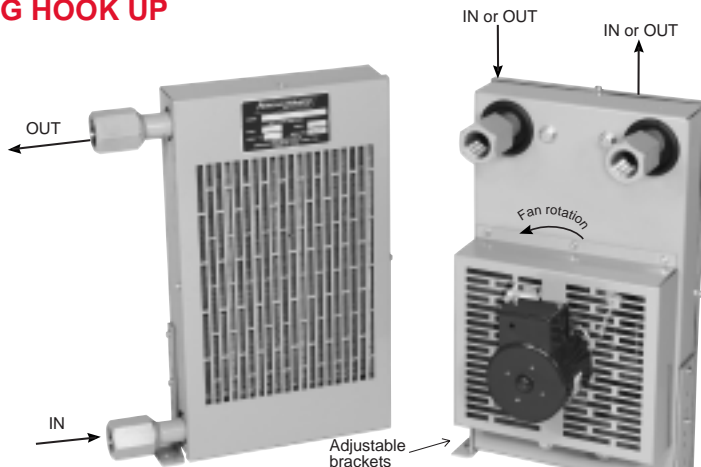
BM-131 & BM-141 (Side Ports)   **BM-132 & BM-142 (Back Ports)**

EXAMPLE OF A MODEL
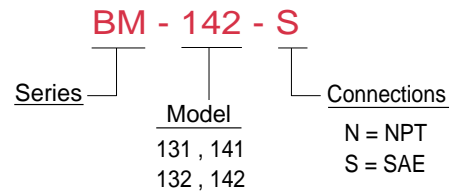
BM - 142 - S

Series   Model   Connections
131 , 141   N = NPT
132 , 142   S = SAE

AOM SERIES

Performance chart: Fs (vertical axis, 100 to 3000) vs GPM (horizontal axis, 1 to 200) showing curves AOM-10, AOM-15, AOM-20, AOM-25, AOM-30, AOM-35, AOM-40, AOM-45.

OIL PRESSURE DROP (PSI) CODE

A = 1 PSI	E = 5 PSI	I = 25 PSI
B = 2 PSI	F = 10 PSI	J = 30 PSI
C = 3 PSI	G = 15 PSI	
D = 4 PSI	H = 20 PSI	
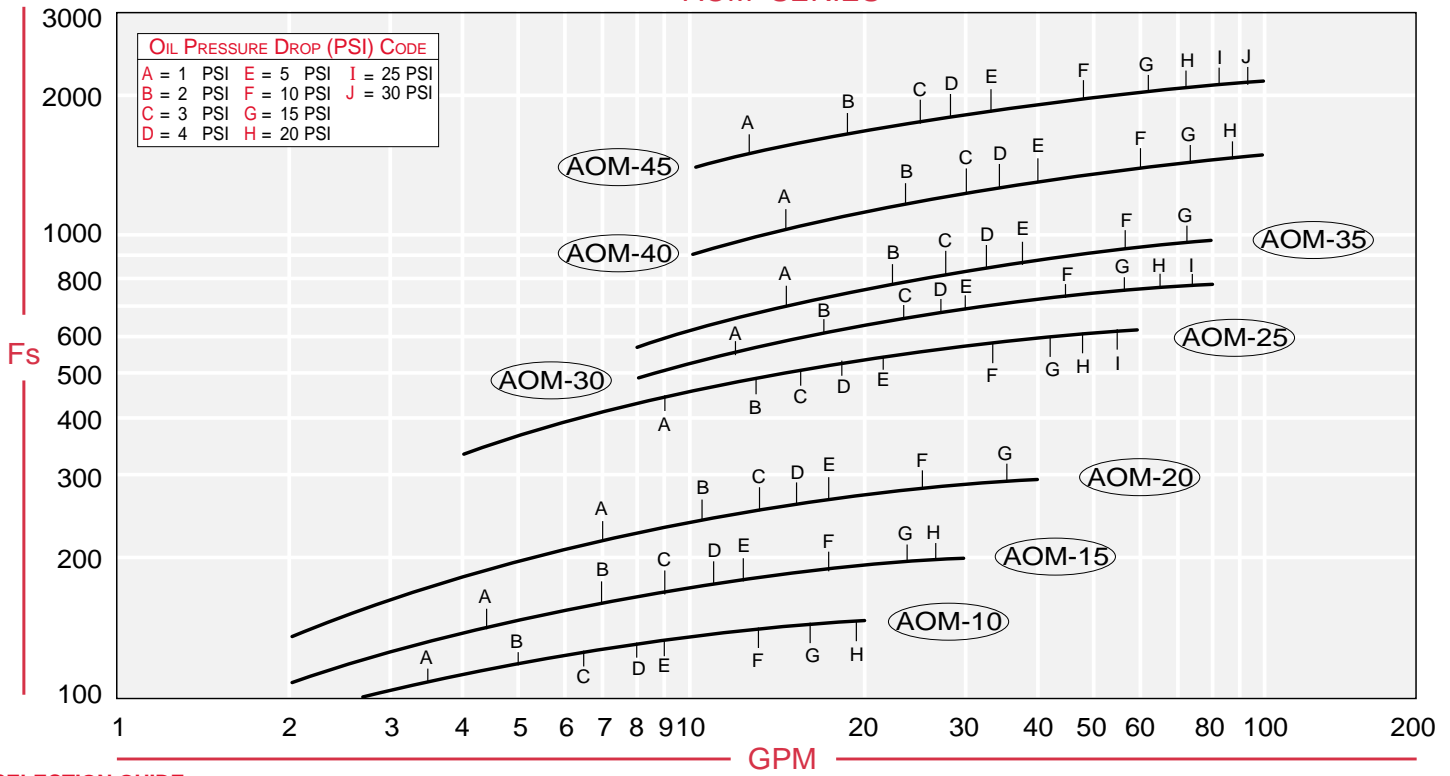
SELECTION GUIDE
The performance curves are based on 50 sus oil & 1000 Standard Feet Per Minute air velocity. If your air velocity is other than 1000 SFPM, please use the correction curve located on this page before choosing a model.

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.

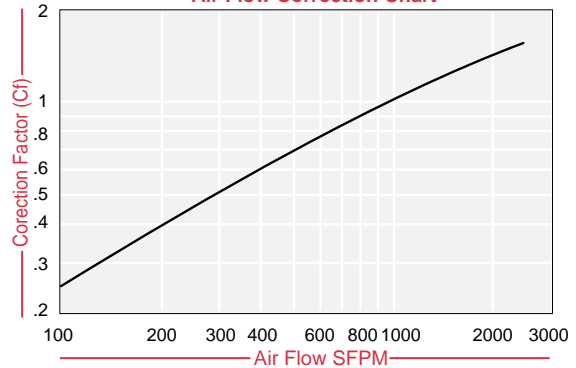$$Fs = \frac{BTU/HR \times Cv}{T - t_{ambient}}$$

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 *see chart*

Air Flow Correction Chart

Chart: Correction Factor (Cf) vertical axis (.2 to 2) vs Air Flow SFPM horizontal axis (100 to 3000).

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

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

Example

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

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

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

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
Pressure drop correction	5.0x1.17 = 5.85 psi	1x1.17 = 1.17 psi

AOM & AOMR DIMENSIONS & WEIGHTS
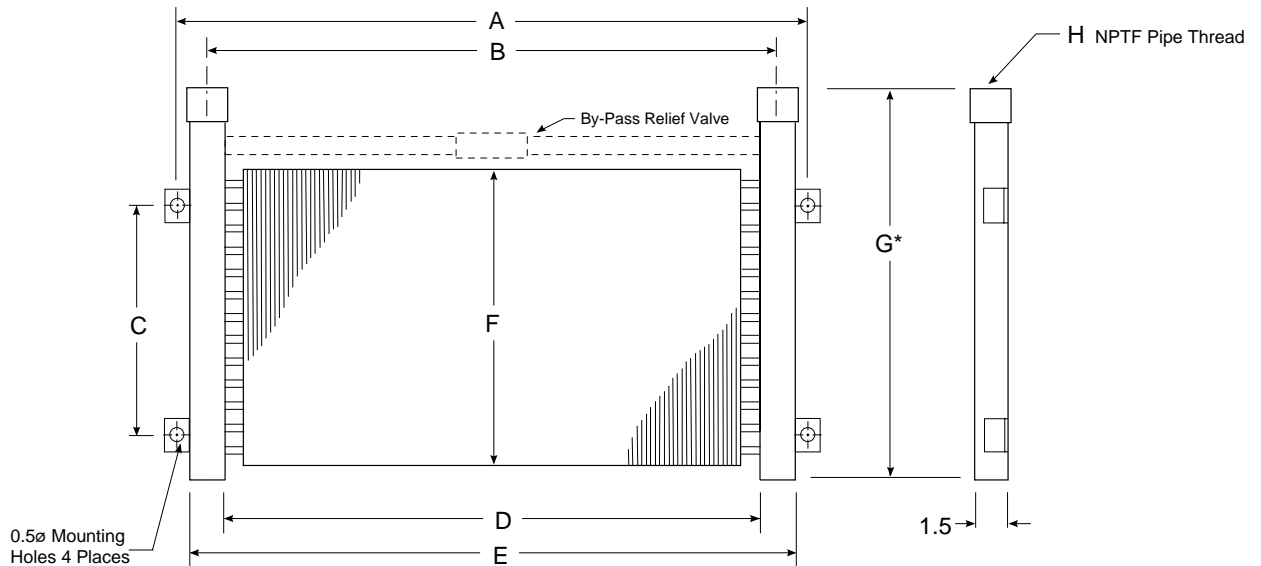
STANDARD DIMENSIONS (inches)												
Model	A	B	C	D	E	F	G AOM	G AOMR	H NPT	H SAE	Face Area	Weight LBS
AOM & AOMR-10-#	19.72	16.72	3.50	14.50	18.22	6.00	8.62	10.06	1.00	16 SAE 1-5/16-12 UN-2B	.60	20
AOM & AOMR-15-#	19.72	16.72	5.50	14.50	18.22	8.00	10.62	12.06	1.00		.81	25
AOM & AOMR-20-#	19.72	16.72	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	16 SAE 1-5/16-12 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

PIPING HOOK UP

IN or OUT   IN or OUT   OUT   IN

EXAMPLE OF A MODEL
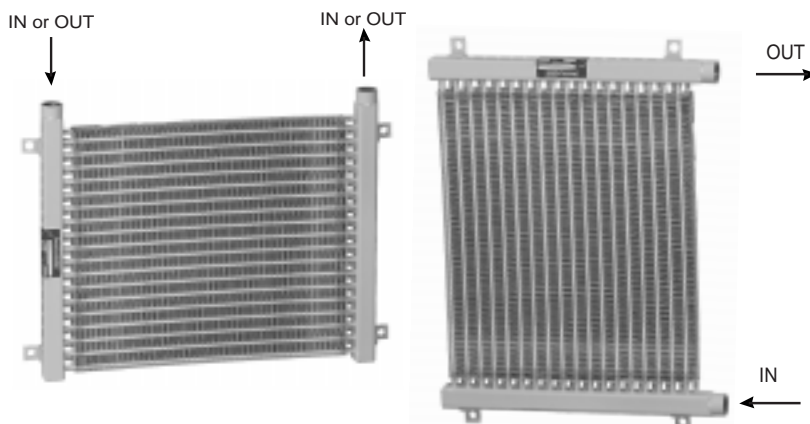
AOM - 25 - NPT

Model   Size   Connections

Size: 10 , 15 , 20 , 25 30 , 35 , 40 , 45

Connections: N = NPT S = SAE

AOMR - 25 - SAE - R - 65

Model   Size   Connections   Relief Valve   PSI Relief

Size: 10 , 15 , 20 , 25 30 , 35 , 40 , 45

Connections: N = NPT S = SAE

PSI Relief: 65 30

NOTE: We reserve the right to make reasonable design changes without notice.

INSTALLATION & MAINTENANCE

HIGH PERFORMANCE TURBULATOR

Exclusive American Industrial Turbulators (installed in every flow tube) increase heat transfer by more than 100%.

American Industrial Turbulators eliminate the laminar flow condition normally associated with other smooth tube heat exchangers. High viscosity hydraulic and lubricating oils are easily cooled by this new state-of-the-art turbulator.

SUPERIOR COOLING FINS

Seamless copper tubes are mechanically bonded to highly efficient aluminum cooling fins. Die-formed fin collars provide a durable precision fit for maximum heat transfer.

Custom fin design forces air to become turbulent and carry heat away more efficiently than old flat fin designs.
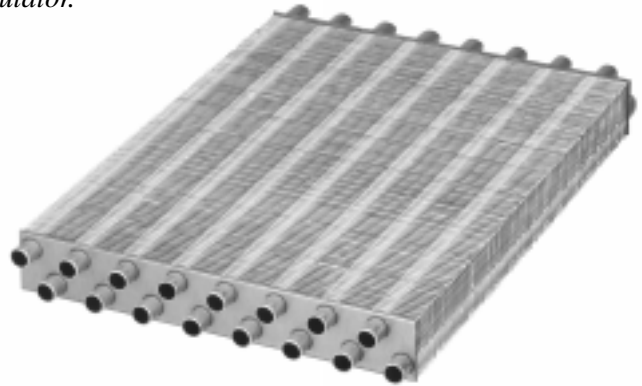
TANKS

State-of-the-art 21st century high temperature brazing method insures permanent bond and positive contact of tube to manifold, eliminating leaks and providing maximum service life.

Receiving:

a) Inspect unit for shipping damage before uncrating. Indicate all damages to the firms' delivery person, and mark it on the receiving bill before accepting the freight. Make sure that the core is not damaged. Since the warranty is based upon the unit date code located on the model identification tag, removal or manipulation of the identification tag will void the manufactures warranty.

b) When handling the heat exchanger, special care should be taken to avoid damage to the core and fan.

c) Models are shipped with one coat of factory applied gray enamel semigloss paint. A finish coat of paint should be applied to all steel surfaces unless storage is indoors. Caution: Do Not paint the aluminum core fins as this could impair the overall performance. The units are washed internally with a mineral spirit/oil solution to remove debris and for temporary rust protection. If storage will be longer than 60 days additional rust preventative should be added to the interior of the core. All openings are sealed with plastic pipe plugs prior to shipment. Check to make sure these are in place prior to storage.

Installation:

a) Plan your installation in a location where there are no obstructions to the inlet or discharge airflow path. Duct work or additional cooling cores added to the housing of the cooler or in front of the cooler would increase the static pressure requirement of the fan motor thus increasing the horsepower requirement of the motor. Ducting should be slightly larger than the core area with long radius turns to prevent added static pressure. Prevailing winds should be considered before installing. Winds blowing heated air back into the cooler could cause loss of cooling especially on hot summer days.

b) We recommend that flexible hose or nonrigid plumbing be used to reduce the risk of failure due to thermal expansion of the core and hydraulic vibration. Hydraulic carrying lines should be sized to handle the appropriate flow and to meet system pressure drop requirements based upon the systems parameters, and not based upon the units supply and return connection size. We suggest that preventative filtration should be located ahead of the cooler to catch any scale or sludge for the system before it enters the cooler.

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The standard oil coolers are built with a brazed core, and carry a 300-PSI maximum working pressure at 400°F maximum temperature. Units should not be placed into a corrosive environment, as rapid deterioration of all exposed components will occur resulting in shortened life or failure. For external corrosive environments please contact our factory prior to installation.

Maintenance:

a) Inspect the heat exchanger for loosened bolts, connections, rust spots, corrosion, fin core clogging, and external fluid leakage.

b) Heat exchangers operating in dirty or dusty environments will often need to have the fins of the core cleaned. Clogged fins should be cleaned by carefully brushing the fins and tubes with water or a light solvent. Use compressed air to blow and loose debris out of the fins. Rinse core with a light degreasing soap and water before reinstalling.

c) Rusty surfaces should be cleaned and re-coated with paint.

d) In most cases with clean hydraulic system oils it will not be necessary to flush the interior of the core. In circumstances where the quality of hydraulic fluid is in question, the core should be disconnected and flushed on a yearly basis with a clean flushing oil/solvent to remove any sludge that has been deposited. For severe cases where the tubes are plugged and cannot be flushed clean with solvent consult factory. We suggest a filter be used at the cooler inlet to reduce the fouling of the tubes.

g) American Industrial has gone to great lengths to provide components that are interchangeable and repairable. If your unit gets damaged, chances are that you can initiate the repairs in your own shop. Cabinets are made of 18 gauge metals that can be bent back into position after external damage. The core is of brazed construction. Core replacement is suggested if it is ever damaged to the point of leakage. Please consult American Industrial for specific repair details.

Return Goods:

If you are returning a product for credit, evaluation, or repair, you must obtain a Return Goods Authorization (RGA) number from American Industrial. Return goods must be shipped prepaid. A detailed written reason for return must accompany the shipment along with the RGA reference number clearly on the label. Failure to follow return procedures could result in lost items, delays, additional service charges, warrantee denial, or refusal of shipment.

All items being returned for restock to American Industrial are subject to a restocking charge. Items sent for service, evaluation or reconditioning are subject to a basic service charge. Please refer to the booklet or contact American Industrial or your local distributor for more detailed information regarding the American Industrial Heat Transfer, Inc. return goods policy.

Review:
1) Contact American Industrial to obtain a RGA number.
2) Securely package shipment to prevent damage to the items.
3) Clearly label the shipping container with the RGA number and your company information.
4) Ship by designated freight carrier "Prepaid".

WARRANTY

American Industrial Heat Transfer, Inc., hereinafter referred to as the "Company" warrants its commercial or industrial products against defects in material and workmanship under normal use and service for a period of one year from the date of shipment from its plant of manufacture.

All obligations and liabilities under this warranty are limited to repairing or replacing, at the Company's option, such as allegedly defective products or parts as are returned, carrier charges prepaid to the plant designated by the Company: 3905 Route 173, Zion, Illinois 60099. All such repairs or replacements are subject to inspection by the Company of the returned products parts at the company's plant. No liability is assumed for costs relating to deinstallation or reinstallation.

Warranty on components or accessories furnished by suppliers to the Company shall be limited to the warranty of the respective component or accessory supplier.

The Company shall not be liable for any contingent, incidental or consequential damages for alleged failure or failure of any of its products, components, or accessories.

If field service at the request of the Buyer is rendered by the Company, and the alleged fault is found not to be with the Company's product, component or accessory, the Buyer shall pay for the time and expenses of the field representative. Bills for service , labor or other expenses that have been incurred by the Buyer, their customer or agent, without approval or authorization by the Company, will not be accepted.

This warranty does not cover failure resulting from the improper installation, mounting design or application nor does it cover failure due to corrosion. The Company's products are not packaged or protected for long periods of storages in generally corrosive atmospheric conditions.

Changes or repairs attempted or made in the field without written authorization from the Company automatically void this warranty.

The Company, whose policy is one of continuous improvement, reserves the right to improve its products through changes in design or material as it may deem desirable without being obligated to incorporate such changes in products of prior manufacture.

WARRANTY PROCEDURES

If you've experienced a problem with your equipment and feel that it is a warranty matter, or you have equipment that needs to be repaired or replaced, contact American Industrial through your local distributor. The basic information that you will need to begin the process is the complete name plate data.

UNITS WILL NOT BE ACCEPTED FOR RETURN UNLESS AN **RGA** NUMBER HAS BEEN ASSIGNED BY AMERICAN INDUSTRIAL, AND THE UNIT IS SHIPPED PREPAID.

COMPANY PROFILE

American Industrial's state-of-the-art manufacturing facility.

MISSION STATEMENT

To manufacture Heat Transfer products by applying state-of-the-art technologies, with the ability to serve a wide variety of industries through professional distribution affiliations throughout North America and abroad.

Since 1985, American Industrial Heat Transfer, Inc. is pleased to offer more than thirty fully manufactured product lines to resolve your heat transfer needs. Our company manufactures all of the heat exchangers as advertised, so that your company is never compromised. Modern state-of-the-art CNC manufacturing machinery, top quality raw materials, and professional engineering services all offered at one source.

Many innovative liquid and air-cooled heat exchanger designs are offered for a wide variety of mobile and industrial applications. The latest technology data processing, manufacturing, and CAD systems are employed throughout our company.

American Industrial is proud to offer one of the strongest authorized distribution networks in the industry with worldwide coverage. Direct access to professional engineering services, no service charge, 24 hour expedite delivery, custom modifications, competitive pricing, etc... are just a few benefits of being an American Industrial customer.

We feel that our future relies on the future of our customers. For that reason we have invested in high-technology automation and professional personnel to give us the competitive edge far into the next millennium.

If you would like to know more about our products, please contact your local American Industrial distributor or contact our company. We appreciate your business and we hope to share with you in your successes.

CNC high accuracy mills and lathes produce precision parts.
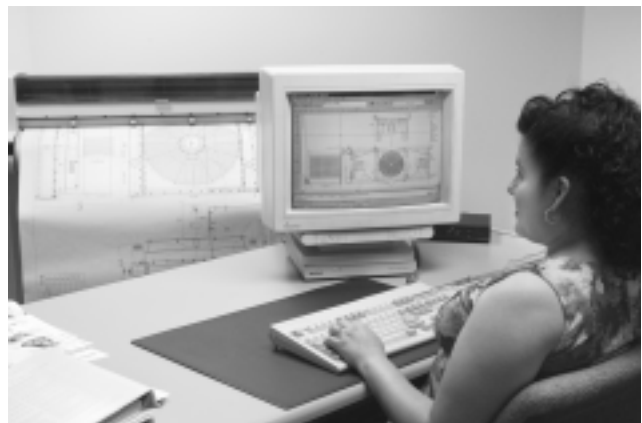
A full line of engineering services are available to assist with technical support, design, Cad drawings, etc...

TECHNICAL

For accurate technical answers, contact our technical services department at 847-731-1055 or fax your requirements to 847-731-3440. A complete offering of product engineering and application services are always available Monday through Friday from 7:30 AM - 5:00 CST.

- Application assistance
- Certificate of conformance
- Certificate of test
- Computerized selection sheet
- Materials certificate
- CAD Drawings

SALES

Our sales specialists are always available to provide help with your requests. To contact one of our sales specialists please call 1-800-338-5959 (847-731-1000) or fax your needs to 847-731-1010. Our sales office is open Monday through Friday from 7:00 AM - 5:00 PM CST.

- Order entry
- Trafficking
- Catalog literature
- Administrative services
- Sales
- Distribution
- Pricing

ACCOUNTING

To contact our accounting services office, please call 847-731-1057or fax your correspondence to 847-731-3440. Our accounting office is open Tuesday through Friday from 9:00 AM - 3:30 PM CST.

- Accounts receivable.
- Accounts payable.
- Account information.

LOCATION

STREET & MAILING ADDRESS:
American Industrial Heat Transfer, Inc.
3905 Route 173
Zion, IL 60099

ACCOUNTING REMIT TO:
American Industrial Heat Transfer, Inc.
Department 77-2634
Chicago, IL 60678-2634

"American Industrial Heat Transfer, Inc. greatly appreciates your business. We are dedicated to do everything humanly possible to provide the highest quality products and services at the lowest possible prices."

"Thank you for your consideration and patronage. We are always aware that you, as a customer, have many choices available. We are sincerely grateful to you for choosing American Industrial Heat Transfer, Inc. and trusting our company as your supplier of heat exchanger products."
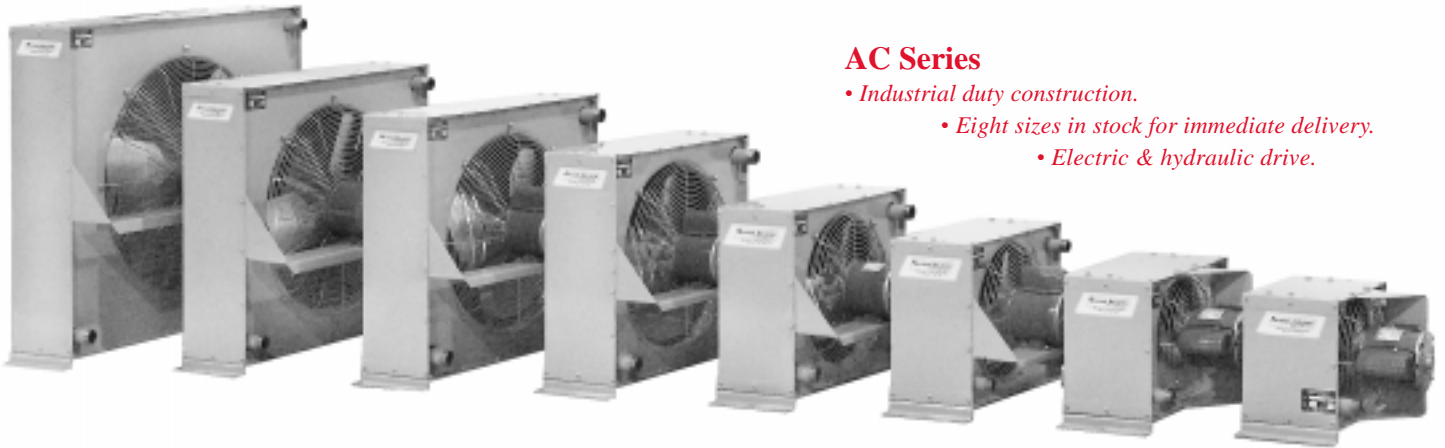

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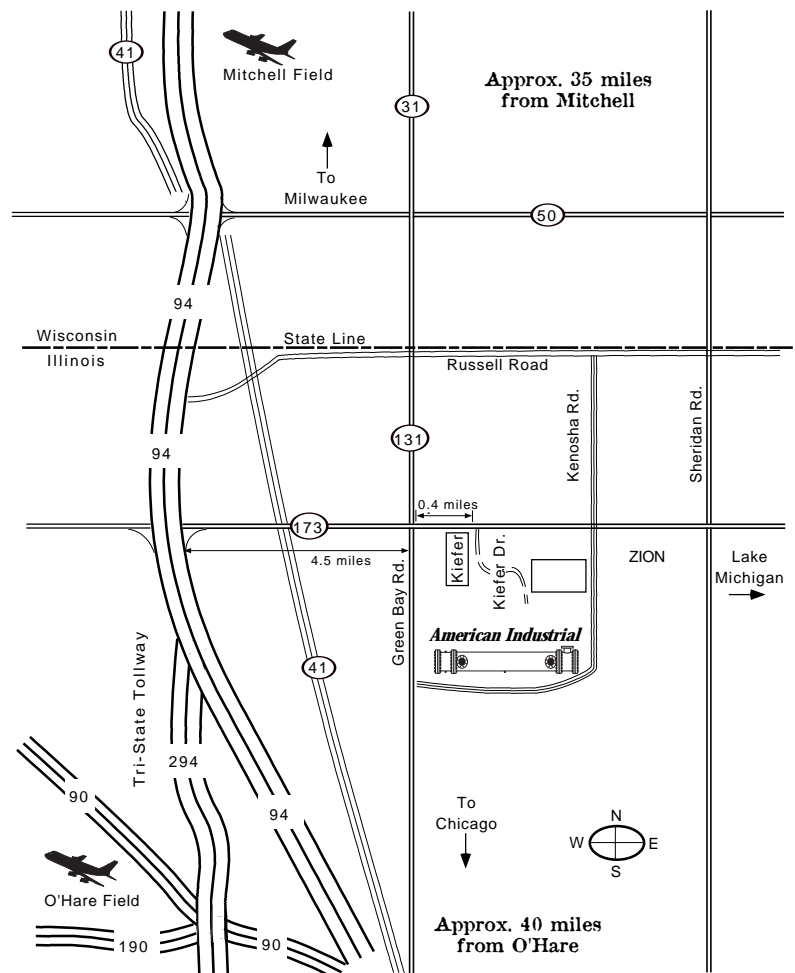
AVAILABLE PRODUCTS
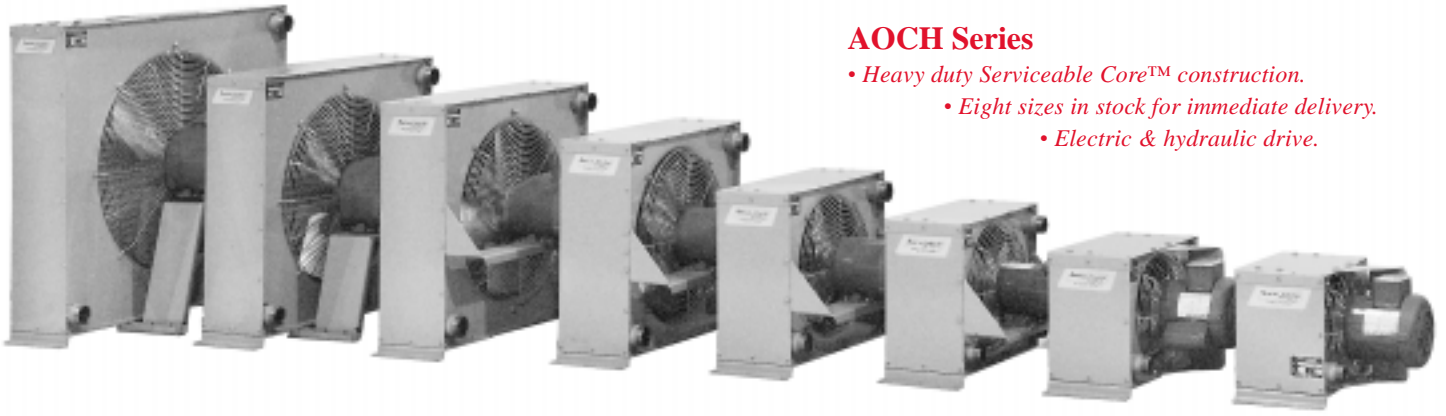
AOCH Series
- *Heavy duty Serviceable Core™ construction.*
  - *Eight sizes in stock for immediate delivery.*
    - *Electric & hydraulic drive.*

AC Series
- *Industrial duty construction.*
  - *Eight sizes in stock for immediate delivery.*
    - *Electric & hydraulic drive.*

AOCH Series *with louvers & Serviceable Core™*

AOCH Series *with screen & Serviceable Core™*

AOCH Series
- *Industrial high capacity air/oil heat exchanger available in 8 standard sizes with electric or hydraulic drive.*

AC,ACHM & ACF Series
- *Industrial air/oil heat exchanger available in 8 standard sizes with electric or hydraulic drive.*

ACA Series
- *Heavy-duty Serviceable Core™ air cooled air after-coolers for compressor sizes up to 500 HP.*
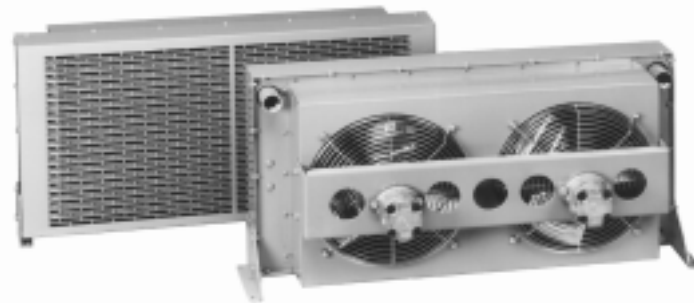
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AOMF Series
• *Low profile air-cooled heat exchangers with 12 & 24 volt fan drive for mobil applications.*

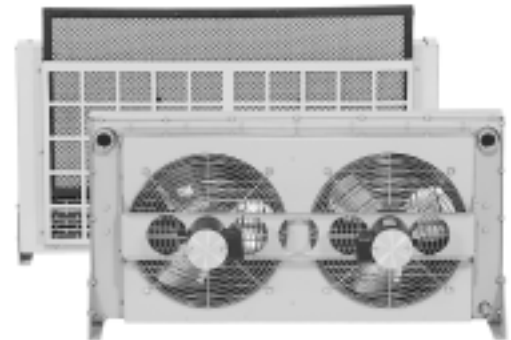**EOC Series** *with electric motor*

EOC Series *with electric motor & filter as an option.*

EOC Series *with hydraulic motor*

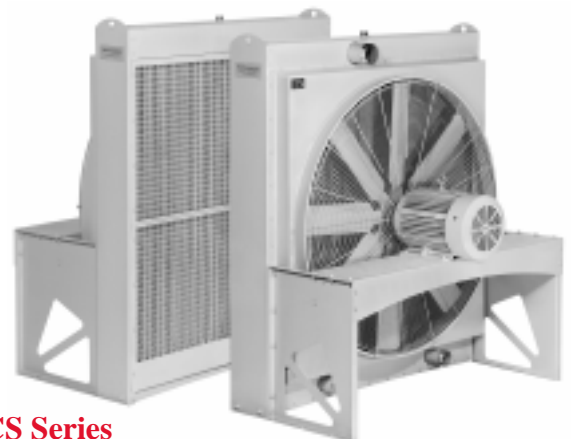**EOC Series** *with 12V DC motor & filter as an option.*

EOC Series
• *Versatile industrial/mobil grade heat exchanger available with Optional Filter, AC, DC, and hydraulic drives.*
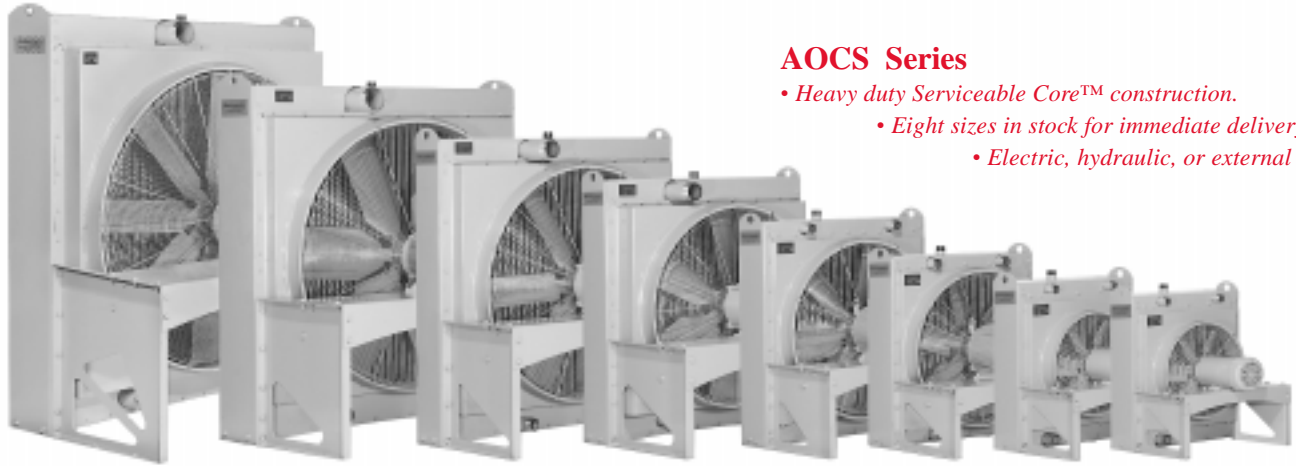
LP Series
• *Low Profile mobile hydraulic air/oil heat exchangers with 12 & 24 volt DC electric motors.*

AOCS Series
• *Durable desin offered in eight sized available from stock for fast delivery.*

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AVAILABLE PRODUCTS

AOCS Series
- *Heavy duty Serviceable Core™ construction.*
  - *Eight sizes in stock for immediate delivery.*
    - *Electric, hydraulic, or external drive.*

CS Series
- *Variety of sizes from 2"-8" diameters, available in a wide range of materials.*

AB 2000-6000 Series
- *High capacity shell & tube heat exchangers, available in sizes from 10"-32" diameters.*

AA Series
- *Variety of sizes from 2"-8" diameters, available in a wide range of materials.*

AB Series
- *Variety of sizes from 2"-8" diameters, available in brass, 316L Stainless Steel.*

URCS Series
- *U-tube heat exchangers for steam services with removable tubes bundle in copper, 316L SS, or 90/10 Cu Ni.*

FBF Series
- *Fixed tube construction with SAE O-Ring or Four Bolt Flanges. Sizes from 2" through 10" diameters.*

3905 Route 173   Zion, Illinois 60099
Telephone: (800) 338-5959 or (847) 731-1000
FAX: (847) 731-1010

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Manufacturers of Quality Heat Exchangers