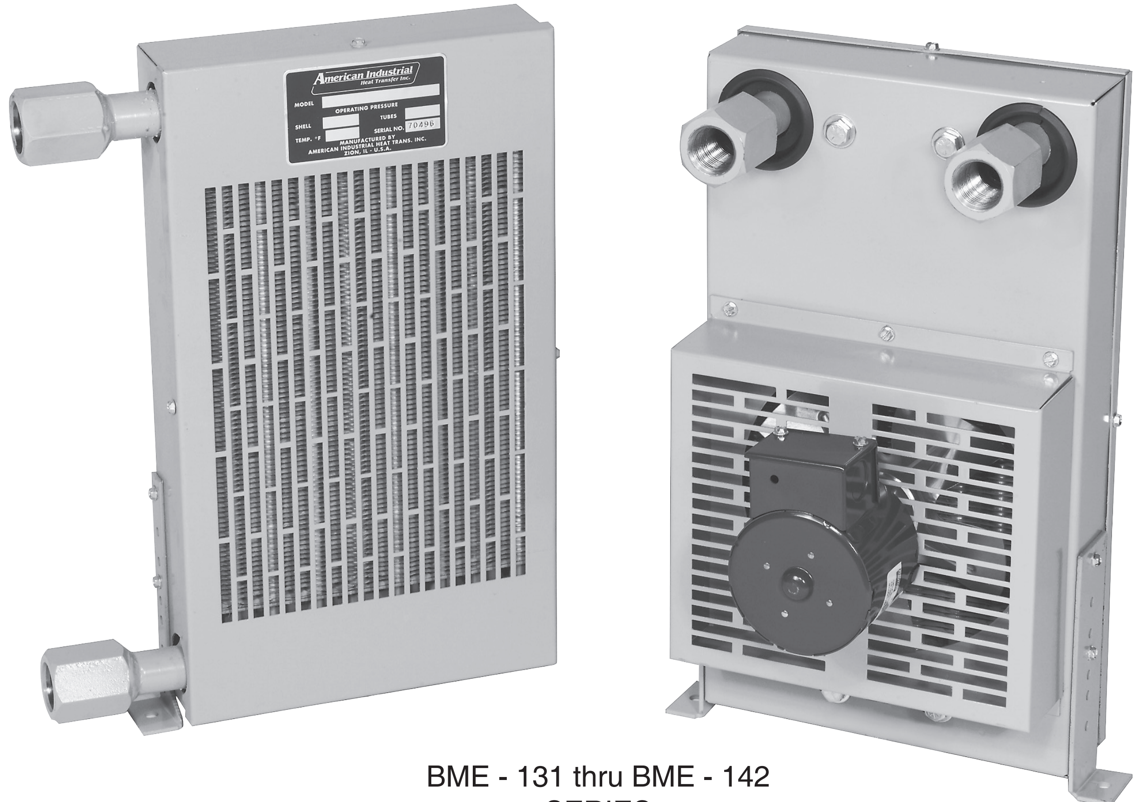
American Industrial
Heat Transfer Inc.

Manufacturer of Quality Heat Exchangers

BME SERIES



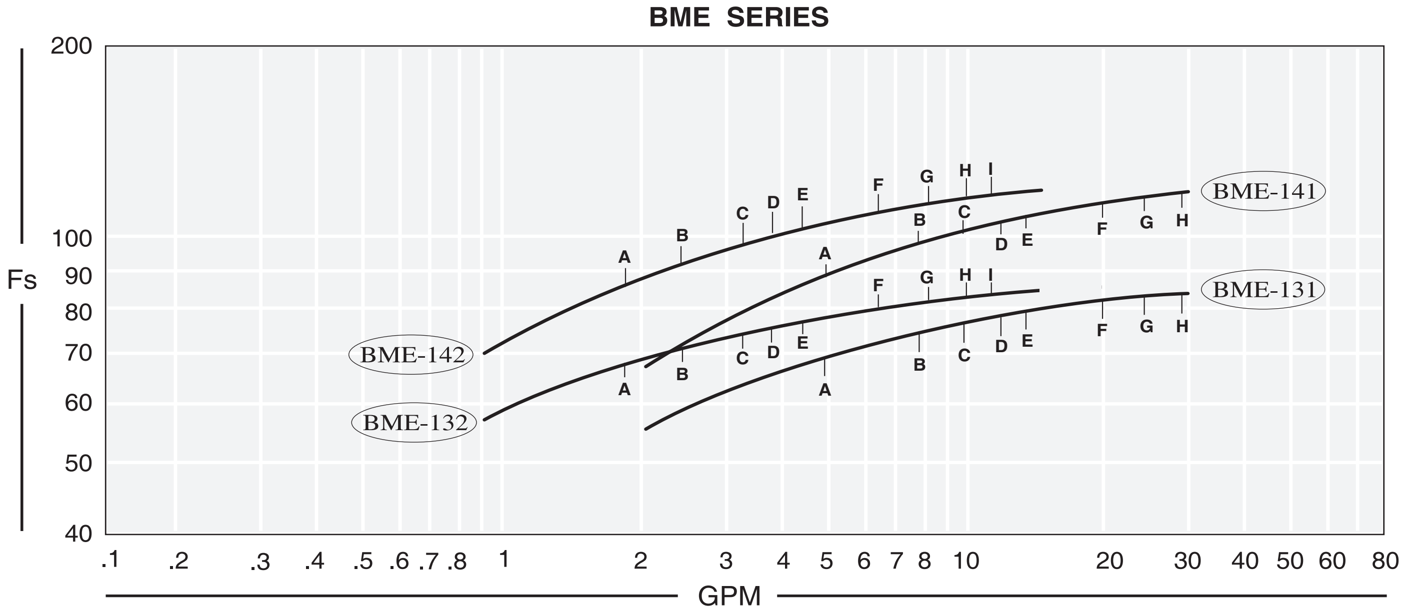
BME - 131 thru BME - 142
SERIES

AIR COOLED

LIQUID COOLERS

- 1/40 HP 115v electric motor.
- Compact design in single or Two Pass.
- Standard NPT or SAE connections.
- Operating temperature of 300°F & pressure of 300PSI.
- Cools case drains, hydraulic presses, bearings gear boxes, hydraulic tools, etc…

BME Series *selection*



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

OIL PRESSURE DROP (PSI) CODE		
A = 1 PSI	D = 4 PSI	G = 15 PSI
B = 2 PSI	E = 5 PSI	H = 20 PSI
C = 3 PSI	F = 10 PSI	I = 25 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: $\dfrac{\text{(1700 psi x 5 gpm)}}{1714}$ = [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.

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

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

$$Fs = \dfrac{\{1.25 \text{ x } 2545 \text{ x } 1.11\}}{\{140\text{ °F} - 100\text{ °F}\}} = 88.3$$

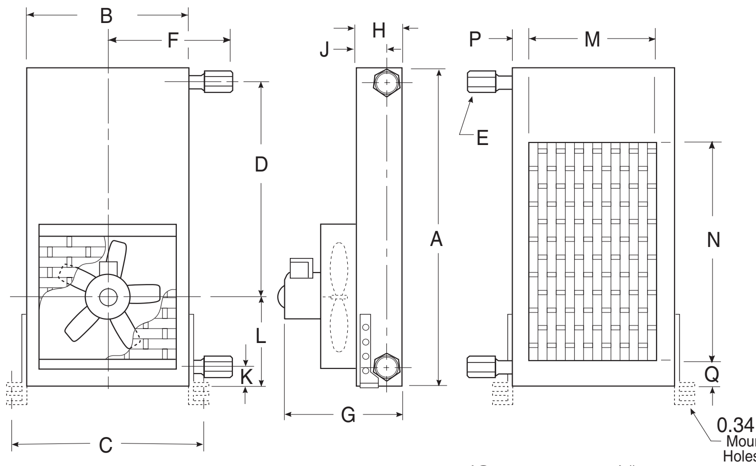
Selection
To select a model, locate the flow rate (GPM) at the bottom of the flow vs Fs graph (on page 4). Proceed upward until the GPM flow rate intersects with the calculated Fs. The curve closest above the intersection point will meet these conditions.

Example: Fs = 88.3 = Model = BME-141
GPM = 5

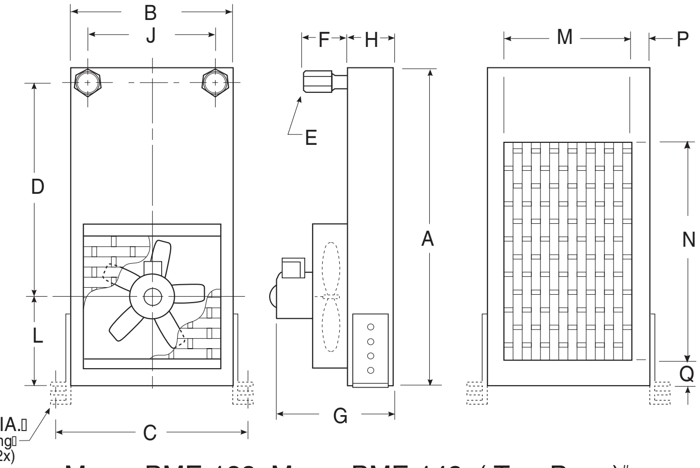
Pressure differentials
Determine the oil pressure drop from the curves as indicated. For viscosities other than 50 ssu, multiply the actual indicated pressure drop for your GPM flow by the value shown in the pressure differential curve for your viscosity value.

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

BME-131 Thru BME-141



MODEL BME-131, MODEL BME-141 (SINGLE PASS)#



MODEL BME-132, MODEL BME-142 (TWO PASS)#

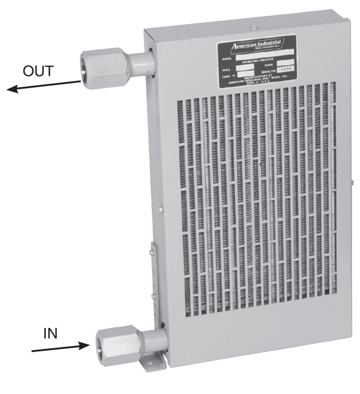
STANDARD DIMENSIONS (inches)																	
Model	A	B	C	D	E NPT	E SAE	F	G Dia.	H	J	K	L	M	N	P	Q	Weight LBS
BME - 131	15.75	9.00	10.25	8.50	.75	#12; 1-1/16-12	7.75	7.00	2.22	.94	1.13	5.88	7.50	10.50	0.75	2.31	18.50
BME - 141							2.69			6.00	–						
BME - 132							7.75			94	1.13						
BME - 142							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		

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

Model	Horse Power	Phase	Hz	Volts	RPM	Enclosure Type	Full Load Amperes
BME - 131	1 / 40	1	60	115	1550	T.E.A.O.	1.0
BME - 132	1 / 40	1	60	115	1550	T.E.A.O.	1.0
BME - 141	1 / 40	1	60	115	3000	T.E.A.O.	1.2
BME - 142	1 / 40	1	60	115	3000	T.E.A.O.	1.2



BM-131 & BM-141
(Side Ports)
(Single Pass)

BM-132 & BM-142
(Back Ports)
(Two Pass)

EXAMPLE OF A MODEL

BME - 142 - S

Series — Model — Connections

N = NPT
S = SAE