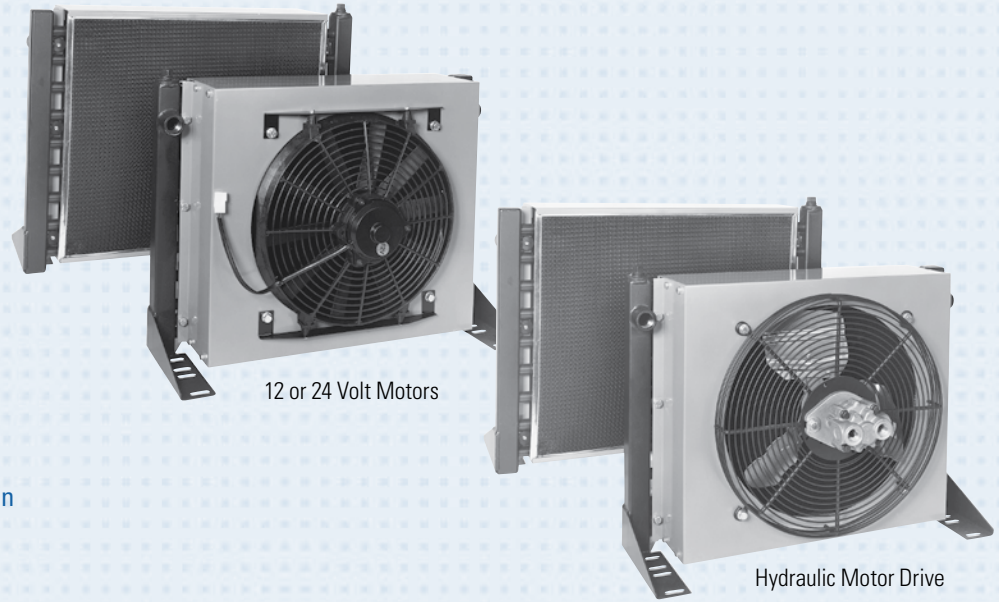


# FLUID COOLING | Mobile AOC Series

AIR COOLED AOC

## Features

- Low AMP Draw Motors
- Remote Mount
- Does Not Block Main Engine Radiator
- Long Life Hydraulic Motor
- Heavy Duty Construction
- 3/4" Tube Size
- Heat Removal up to 160 HP
- Oil Flows to 150 GPM
- DC or Hydraulic Motors
- SAE Connections Standard
- High Performance Air Side Fin Design



## OPTIONS

- Built-in Serviceable Bypass Valve
- NPT or BSPP or SAE Connections

## Ratings

- Operating Pressure** 300 psi
- Test Pressure** 300 psi
- Operating Temperature** 350° F

## Materials

- Tubes** Copper
- Fins** Aluminum
- Turbulators** Aluminum
- Fan Blade** (DC Motor) High Impact Plastic
- Fan Blade** (Hydraulic motor) Aluminum with steel hub
- Fan Guard** (Hydraulic Motor) Steel with black baked enamel finish
- Manifolds** Steel
- Connections** Steel
- Cabinet** Steel with baked enamel finish
- Filter** Stainless frame with washable media
- Nameplate** Aluminum

## Relief Bypass Valve Option

MODEL	DESCRIPTION
AOC-19 thru AOC-33	Available in either 30 psi or 60 psi settings. 3/4", external, all steel valve. May be removed for servicing.
AOC-37 thru AOC-70	Available in either 30 psi or 60 psi settings. 1-1/2", external, all steel valve. May be removed for servicing.

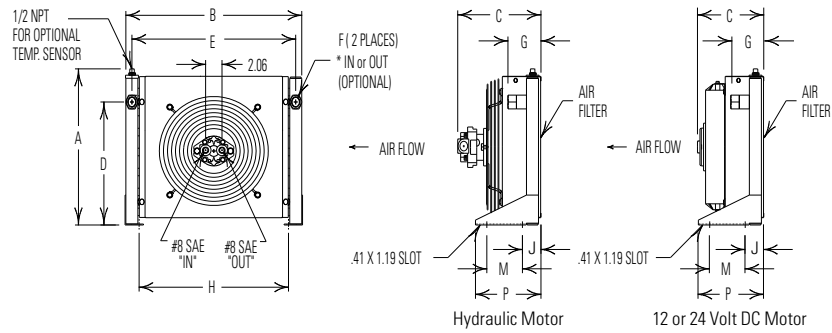
## How to Order

<b>AOC</b>	-	[ ] [ ]	-	[ ]	-	[ ]	-	[ ]
<b>Model Series</b> AOC - Standard		<b>Model Size Selected</b>		<b>Connection Type*</b> 1 - NPT 2 - SAE 3 - BSPP		<b>Relief Bypass</b> Blank - No Bypass 30 - 30 psi 60 - 60 psi		<b>Specify Motor Required</b> NM - No Motor 4A - 12 Volt 4B - 24 Volt 9 - Hydraulic Motor

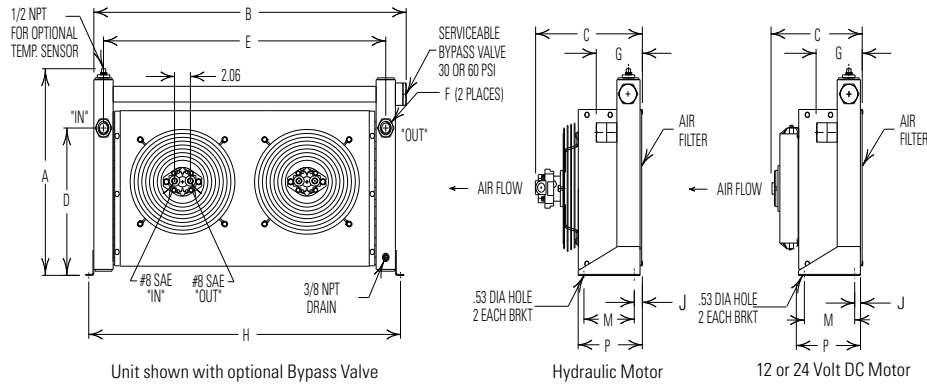
\*Other connection types available. Please consult factory for assistance.

# Dimensions

## AOC-19 thru AOC-33



## AOC-37 thru AOC-70



Unit shown with optional Bypass Valve

MODEL	A		B		C		D	E	F		G		H	J	M	P	Weight LBS.
	NO BYPASS	WITH BYPASS	NO BYPASS	WITH BYPASS	HYD MOTOR	DC MOTOR			SAE	NPT & BSPP	SAE	NPT & BSPP					
AOC-19	13.62	16.00	16.50	18.16	10.40	7.92	10.31	15.00	#12	.75	3.05	4.12	14.75	2.61	5.00	8.18	30
AOC-22	15.62	18.00	22.00	23.66			12.31	20.50					18.69				33
AOC-24	19.62	22.00	24.75	26.41	11.58	9.69	16.31	23.25					21.44				46
AOC-33	25.62	28.00	30.25	31.91	14.06	10.84	22.31	28.75	#16	1.00	4.34	26.97	26.97	1.06	6.50	8.31	65
AOC-37	18.50	21.38	39.00	40.38			15.25	36.50					4.62				5.97
AOC-50	22.50	25.38	41.00	42.38	14.93	15.08	19.25	38.50	#20	1.25	4.68	6.03	42.50	1.12	9.00	12.37	120
AOC-54	30.50	33.28	42.00	43.38			27.25	39.50					#24				1.50
AOC-57	36.50	39.38	48.00	49.38	17.79	24.62	32.75	45.50	#32	2.00	6.68	8.15	49.75	1.62	12.12	304	
AOC-70	38.38	41.25	51.00	52.38			34.00	48.50					8.44				9.91

Notes: Maximum pressure is 2000 PSI. Stated Minimum Operating Pressure is at Inlet Port of Motor. 1000 PSI Allowable Back Pressure.

# Specifications

## Hydraulic motor data

MODEL	NUMBER OF FANS	MAXIMUM FAN SPEED	OIL FLOW REQUIRED PER FAN (GPM)	MINIMUM OPERATING PRESSURE (PSI)	MOTOR (IN <sup>3</sup> /REV) DISPLACEMENT
AOC - 19 thru AOC - 33	1	1725 RPM	1.6	300	.22
AOC - 37 thru AOC - 57	2				
AOC - 70	2				

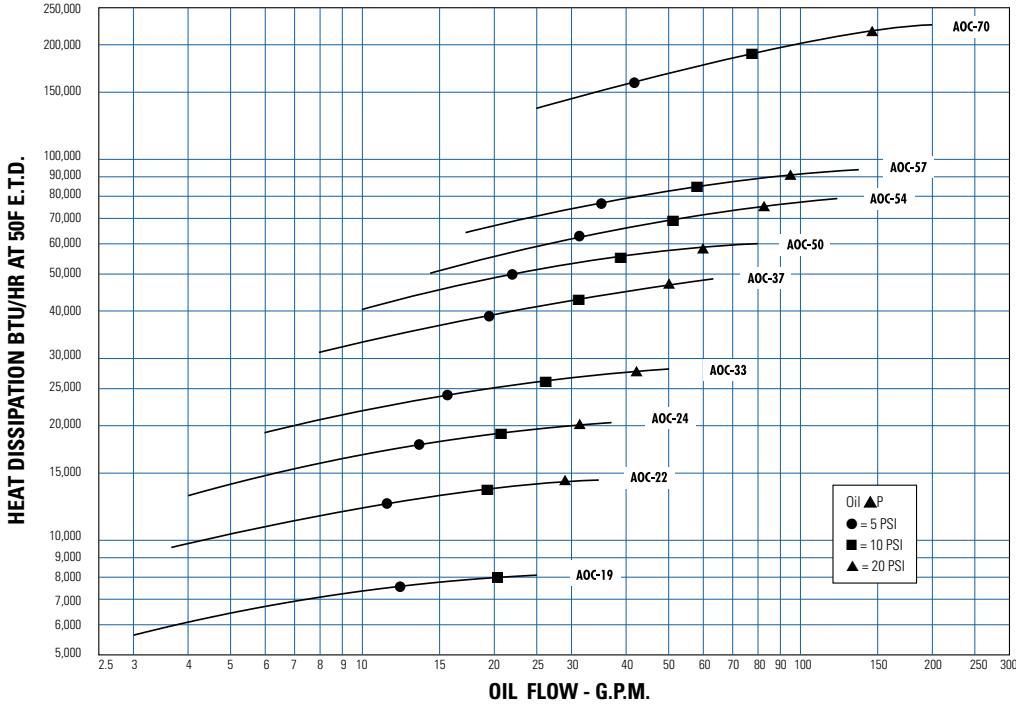
All dimensions in inches. We reserve the right to make reasonable design changes without notice. \*Inlet and outlet oil ports reversible if relief bypass option is not used.

## 12 and 24 volt DC motor data

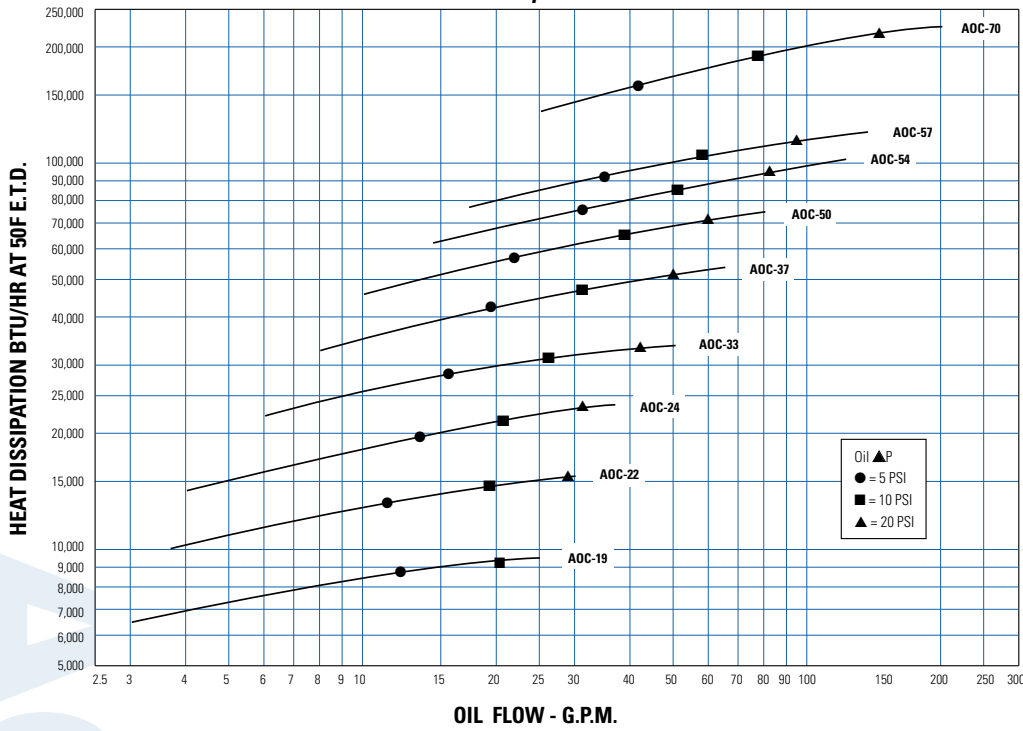
MODEL	NUMBER OF FANS	FULL LOAD AMPS PER MOTOR 12 VOLT	FULL LOAD AMPS PER MOTOR 24 VOLT	HORSEPOWER PER MOTOR	FAN SPEED	FAN DIAMETER (INCHES)
AOC - 19	1	12.5	6.3	1/5	1800 RPM	10
AOC - 22						12
AOC - 24, 33						14
AOC - 37	2	80	39	1	1800 RPM	12
AOC - 50, 54, 57						14
AOC - 70						20

# Performance Curves

### AOC - with DC Motor



### AOC - with Hydraulic Motor



# Selection Procedure

Performance Curves are based on 50SSU oil entering the cooler 50°F higher than the ambient air temperature used for cooling. This is also referred to as a 50°F Entering Temperature Difference (ETD).

**STEP 1 Determine the Heat Load.** This will vary with different systems, but typically coolers are sized to remove 25 to 50% of the input nameplate horsepower.

(Example: 100 HP Power Unit x .33 = 33 HP Heat load.)

To convert HP to BTU/Hr: HP x 2545 = BTU/Hr

**STEP 2 Entering Temperature Difference.** Desired oil entering cooler °F – Ambient air temp. °F = Actual ETD

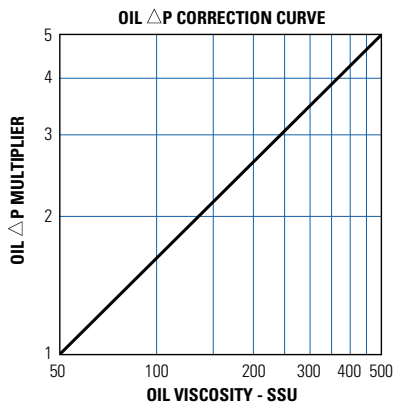
**STEP 3 Determine Curve BTU/Hr Heat Load.** Enter the information from above:

$$\text{BTU/Hr heat load} \times \frac{50 \times C_v}{\text{ETD}} = \text{Curve BTU/Hr}$$

**STEP 4 Enter curves** at oil flow through cooler and curve horsepower. Any curve above the intersecting point will work.

**STEP 5 Determine Oil Pressure Drop from Curves:**

● = 5 PSI; ■ = 10 PSI; ▲ = 20 PSI. Multiply pressure drop from curve by correction factor found in oil  $\Delta P$  correction curve.



## C<sub>v</sub> Viscosity Correction

Average Oil Temp °F	OIL				
	SAE 5 110 SSU at 100°F 40 SSU at 210°F	SAE 10 150 SSU at 100°F 43 SSU at 210°F	SAE 20 275 SSU at 100°F 50 SSU at 210°F	SAE 30 500 SSU at 100°F 65 SSU at 210°F	SAE 40 750 SSU at 100°F 75 SSU at 210°F
100	1.14	1.22	1.35	1.58	1.77
150	1.01	1.05	1.11	1.21	1.31
200	.99	1.00	1.01	1.08	1.10
250	.95	.98	.99	1.00	1.00

## Desired Reservoir Temperature

**Return Line Cooling:** Desired temperature is the oil temperature leaving the cooler. This will be the same temperature that will be found in the reservoir.

**Off-Line Recirculation Cooling Loop:** Desired temperature is the oil temperature entering the cooler. In this case, the oil temperature change must be determined so that the actual oil leaving temperature can be found. Calculate the oil temperature change (oil  $\Delta T$ ) with this formula:  
Oil  $\Delta T = (\text{BTU's/Hr.}) / (\text{GPM Oil Flow} \times 210)$ .

To calculate the oil leaving temperature from the cooler, use this formula:  
Oil Leaving Temp. = Oil Entering Temp – Oil  $\Delta T$ .

This formula may also be used in any application where the only temperature available is the entering oil temperature.

**Oil Pressure Drop:** Most systems can tolerate a pressure drop through the heat exchanger of 20 to 30 PSI. Excessive pressure drop should be avoided. Care should be taken to limit pressure drop to 5 PSI or less for case drain applications where high back pressure may damage the pump shaft seals.

## Oil Temperature

Typical operating temperature ranges are:

Hydraulic Motor Oil	110° - 130°F
Hydrostatic Drive Oil	130° - 180°F
Bearing Lube Oil	120° - 160°F
Lube Oil Circuits	110° - 130°F