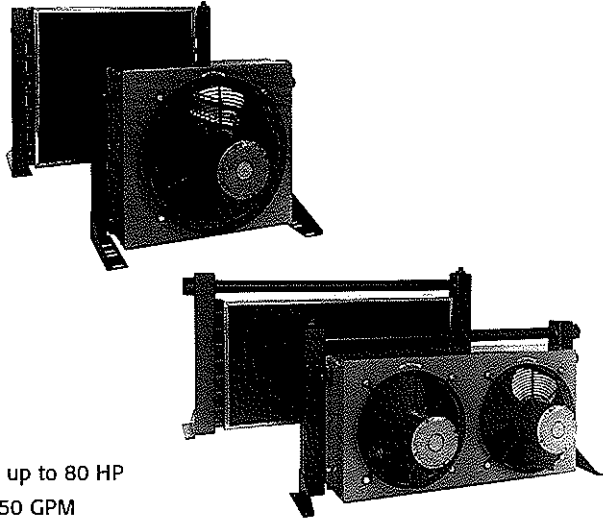


AIR COOLED INDUSTRIAL/AOC SERIES

air cooled
AOC

LOW COST
INDUSTRIAL DUTY
QUIET OPERATION



- Heat Removal up to 80 HP
- Oil Flows to 150 GPM
- Mounting Brackets Included
- SAE Connections
- Single or Three-Phase 60/50 Hz Motors
- Filter Standard

OPTIONS:

Built-in Serviceable Bypass Valve
NPT or BSPP Oil Connections

MATERIALS

Tubes - Copper
Fins - Aluminum
Turbulators - Aluminum
Fan Blade - Aluminum with steel hub
Fan Guard - Steel with black baked enamel finish
Cabinet - Steel with baked enamel finish

Manifolds - Copper; Model AOC-08
Steel; Models AOC-19 – AOC-70
Connections - Brass; Model AOC-08
Steel; Models AOC-19 – AOC-70
Nameplate - Aluminum
Filter - Stainless frame with washable media

RATINGS

Operating pressure - 300 psi
Test pressure - 300 psi
Operating temperature - 350°F

HOW TO ORDER - AOC-08 MODELS ONLY

AOC	0	8				
MODEL SERIES AOC - STANDARD	MODEL SIZE SELECTED		FLUID PASSES	CONNECTION TYPE	RELIEF BYPASS	SPECIFY MOTOR REQUIRED
			1 = 1 PASS 2 = 2 PASS 4 = 4 PASS	1 = NPT 2 = SAE 3 = BSPP	BLANK = NO BYPASS 30 - 30 PSI 60 - 60 PSI	115 VOLT SINGLE PHASE 230/240 VOLT SINGLE PHASE NO MOTOR

HOW TO ORDER - ALL MODELS EXCEPT AOC-08 SIZE

AOC					
MODEL SERIES AOC - STANDARD	MODEL SIZE SELECTED		CONNECTION TYPE	RELIEF BYPASS	SPECIFY MOTOR REQUIRED
			1 = NPT 2 = SAE 3 = BSPP	BLANK = NO BYPASS 30 - 30 PSI 60 - 60 PSI	SINGLE PHASE THREE PHASE 575 VOLT NO MOTOR

SPECIFICATIONS

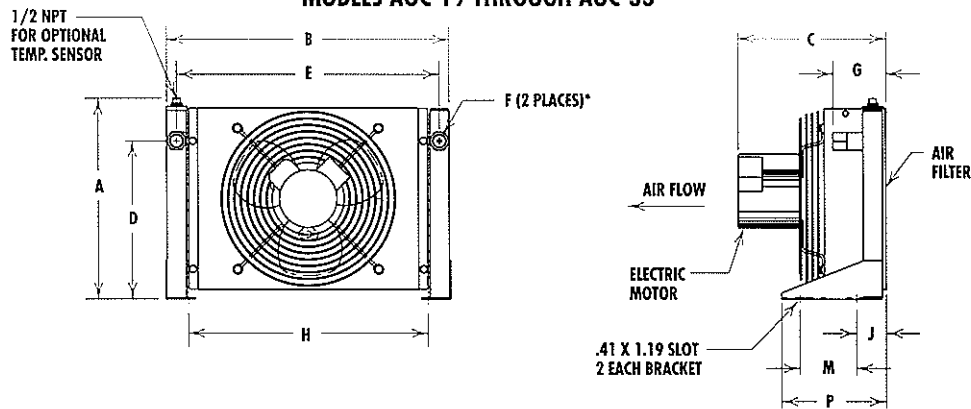
ELECTRIC MOTOR DATA

MODEL	MOTOR POWER	# OF MOTORS	FRAME SIZE	SINGLE PHASE	THREE PHASE	575 VOLT	RPM	TYPE	BEARINGS B-BALL S-SLEEVE	THERMAL OVERLOAD	dB(A) 3 FT.
AOC-19 Thru AOC-33	1/4	1	Custom	115/230V/60/50Hz	208-230/460V/60 Hz	575/500V/60/50Hz	1700 (60 Hz)	TEAO	S	YES	80
AOC-37 Thru AOC-57				3.2/1.6 Amps Full Load 60 Hz 2.8/1.4 Amps Full Load 50 Hz	190/380-415V/50 Hz 1.3/.65 Amps Full Load 60 Hz 1.1/.55 Amps Full Load 50 Hz	.65 Amps Full Load 60 Hz .60 Amps Full Load 50 Hz	1350 (50 Hz)				84
AOC-70	1	2	56C	115/208-230V/60 Hz 12.8/6.4 Amps Full Load	208-230/460V/60 Hz 190/380-415V/50 Hz 3.4/1.7 Amps Full Load 60 Hz 3.6/1.9 Amps Full Load 50 Hz	575/500V/60/50Hz 1.5 Amps Full Load 60 Hz 1.4 Amps Full Load 50 Hz	1725 (60 Hz) 1425 (50 Hz)	TEFC	B	NO	90

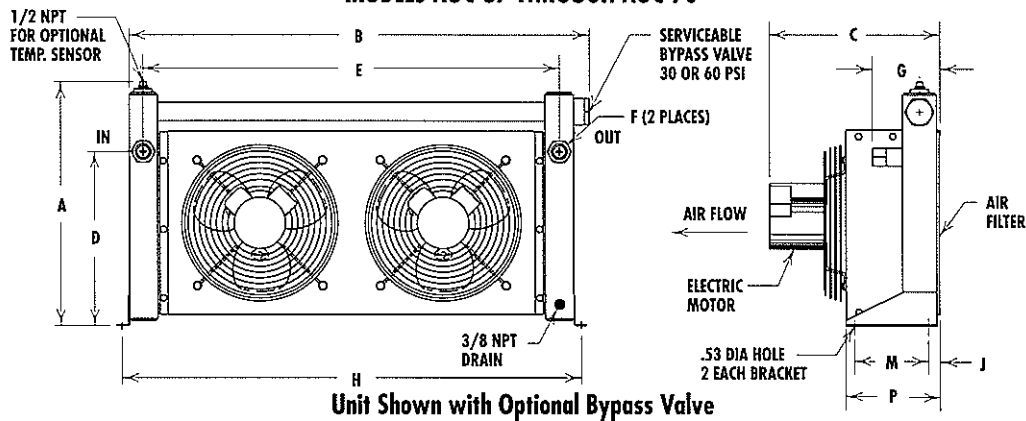
NOTE: Amp ratings are per motor. De-rate cooler performance by 10% when used in 50 Hz service.

DIMENSIONS

MODELS AOC-19 THROUGH AOC-33



MODELS AOC-37 THROUGH AOC-70



MODEL	A		B		C	D	E	F		G		H	J	M	P	Weight lbs.
	No Bypass	Bypass	No Bypass	Bypass				SAE	NPT & BSPP	SAE	NPT & BSPP					
AOC-19	13.62	16.00	16.50	18.16	13.08	10.31	15.00					14.75				19
AOC-22	15.62	18.00	22.00	23.66	12.19	12.31	20.50	#12	.75	3.05	4.12	18.69	2.61	5.00	8.18	33
AOC-24	19.62	22.00	24.75	26.41	13.19	16.31	23.25					21.44				46
AOC-33	25.62	28.00	30.25	31.91		22.31	28.75	#16	1.00		4.34	26.97				
AOC-37	18.50	21.38	39.00	40.38	15.66	15.25	36.50	#20	1.25	4.62	5.97	40.50	1.06	6.50	8.31	95
AOC-50	22.50	25.38	41.00	42.38	15.62	19.25	38.50			4.68	6.03	42.50				1.12
AOC-54	30.50	33.28	42.00	43.38	17.09	27.25	39.50	#24	1.50	4.89	6.30	43.75	1.87	9.00	12.37	154
AOC-57	36.50	39.38	48.00	49.38	16.72	32.75	45.50			6.68	8.15	49.75				
AOC-70	38.38	41.25	51.00	52.38	22.62	34.00	48.50	#32	2.00	8.44	9.91	52.75	1.62	12.12	322	

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.

SELECTION PROCEDURE

Performance Curves are based on 100SSU oil leaving the cooler 40°F higher than the ambient air temperature used for cooling. This is also referred to as a 40°F approach temperature.

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.)

If BTU/Hr. is known: $HP = \frac{BTU/Hr}{2545}$

Step 2. Determine Approach Temperature.

Desired oil leaving cooler °F – Ambient air temp. °F = Actual Approach

Step 3. Determine Curve Horsepower Heat Load.

Enter the information from above:

Horsepower heat load x $\frac{40}{\text{Actual Approach}}$ = Curve Horsepower

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; + = 40 PSI. Multiply pressure drop from curve by correction factor found in oil ΔP correction curve.

Oil Temperature: Oil coolers can be selected using *entering* or *leaving* oil temperatures.

Typical operating temperature ranges are:

Hydraulic Oil: 110°F - 130°F, Hydrostatic Drive Oil: 130°F - 180°F, Bearing Lube Oil: 120°F - 160°F, Lube Oil Circuits: 110°F - 130°F.

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 ΔT) with this formula:
Oil ΔT = (BTU's/Hr.) / (GPM Oil Flow x 210).

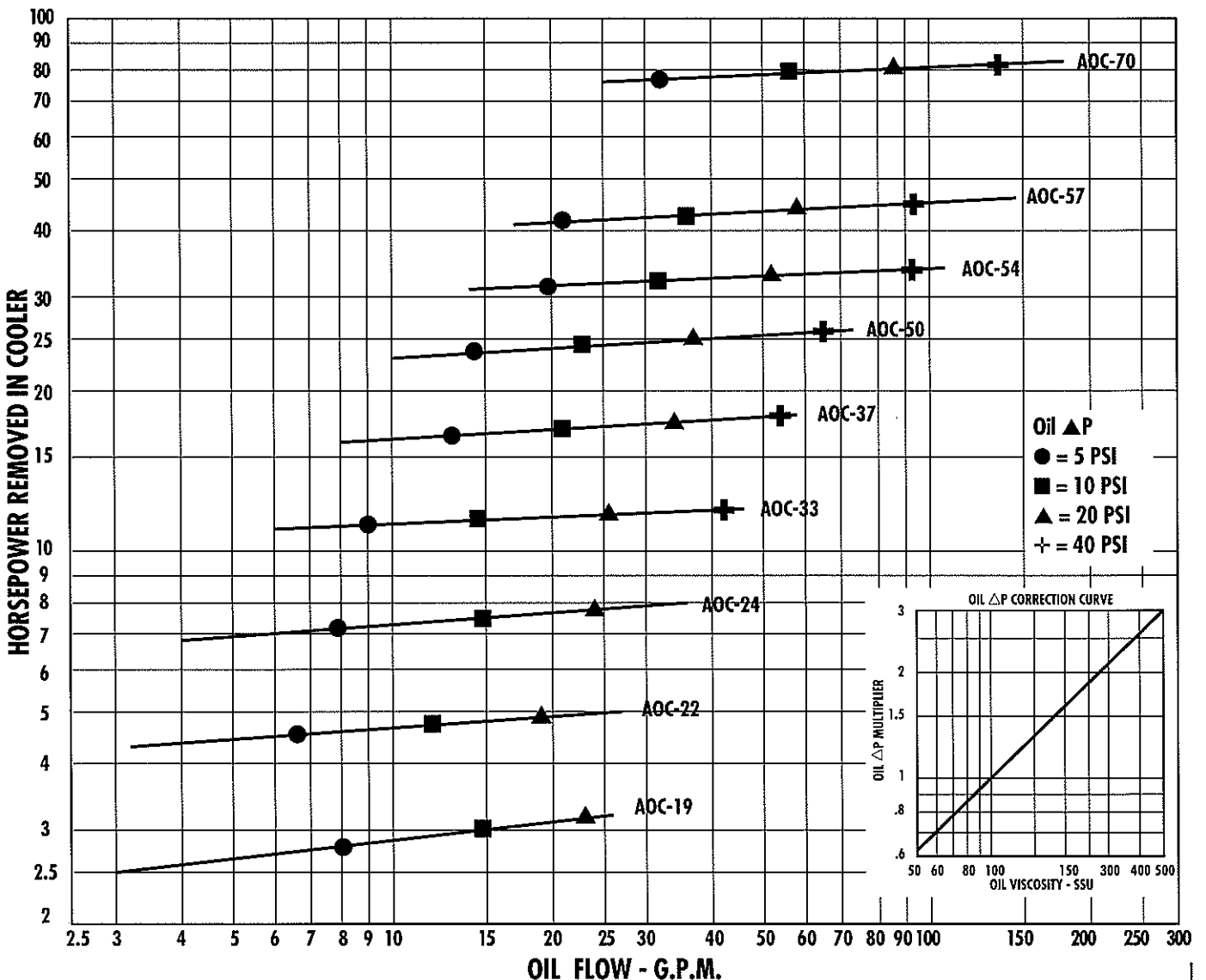
To calculate the oil leaving temperature from the cooler, use this formula:

Oil Leaving Temp. = Oil Entering Temp - Oil ΔT.

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

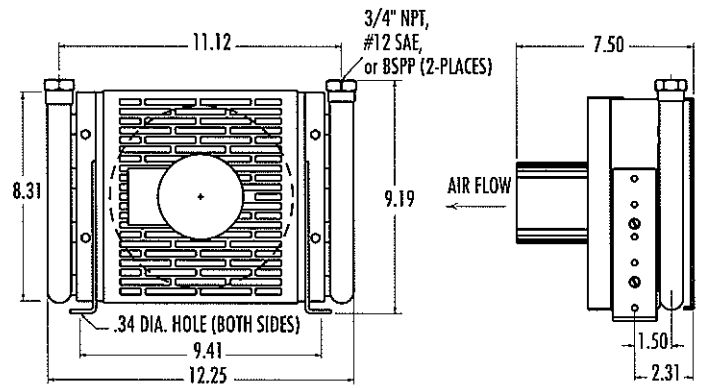
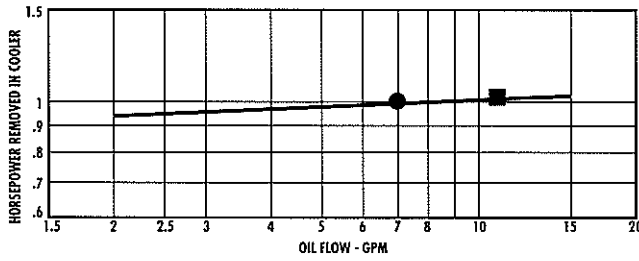
Oil Pressure Drop: Most systems can tolerate a pressure drop through the heat exchanger of 20 to 30 PSI. Excessive pressure drop should be avoided. Care should be taken to limit pressure drop to 5 PSI or less for case drain applications where high back pressure may damage the pump shaft seals.

PERFORMANCE CURVES

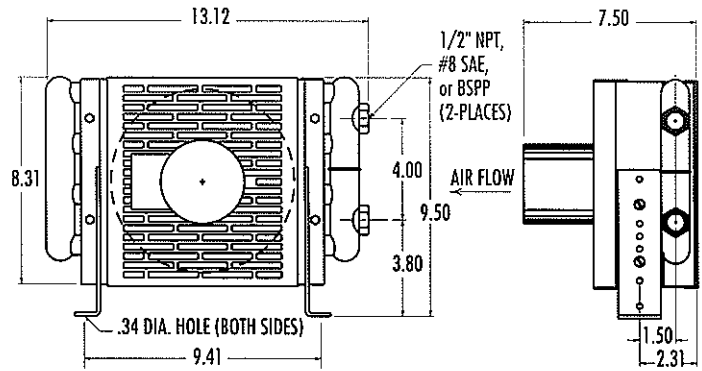
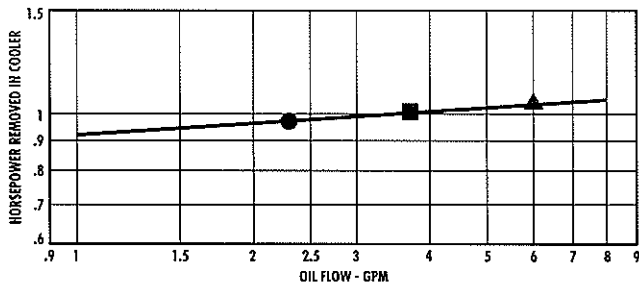


AOC-08 MODEL ONLY

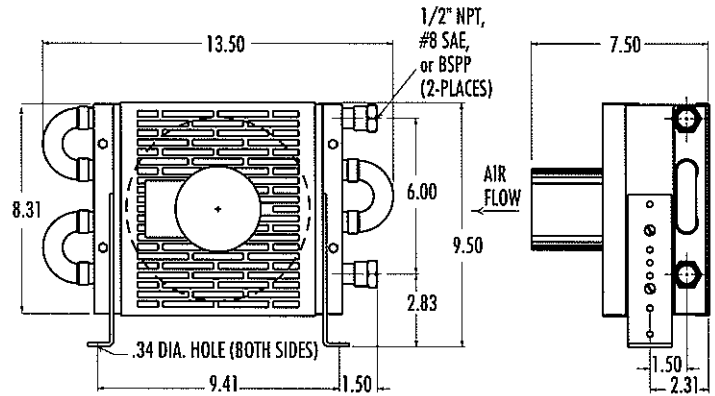
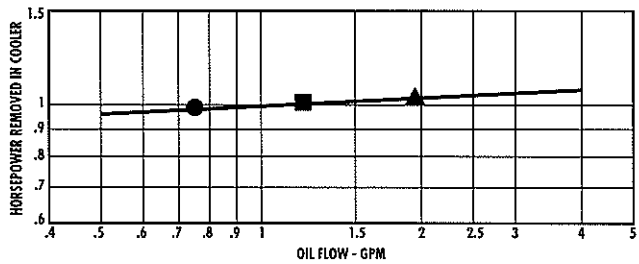
ONE PASS



TWO PASS



FOUR PASS



ELECTRIC MOTOR DATA

MODEL	MOTOR POWER	115/230 VOLT	50/60 Hz	TYPE	RPM	BEARINGS B-BALL S-SLEEVE	THERMAL OVERLOAD	SHIPPING WEIGHT (lbs.)	dB(A) 3 FT.
AOC-08	1/30	115 VOLT 230 VOLT	1.1 Amps Full Load .7 Amps Full Load	TEAO	3000	S	YES	12	70

NOTE: De-rate cooler performance by 10% when used in 50 Hz service.

RELIEF BYPASS VALVE OPTION

MODEL	DESCRIPTION
AOC-08	Available in one pass (30 and 60 psi) and two pass (60 psi) designs only. Valves are built into tubes and do not affect external dimensions. All steel valves. Non-serviceable.
AOC-19 thru AOC-33	Available in 30 psi or 60 psi settings. 3/4", external, all steel valve. May be removed for servicing.
AOC-37 Thru AOC-70	Available in 30 psi or 60 psi settings. 1-1/2", external, all steel valve. May be removed for servicing.

AIR COOLED MOBILE PRODUCTS DIVISION/AOC SERIES

air cooled
AOC

LOW AMP DRAW MOTORS

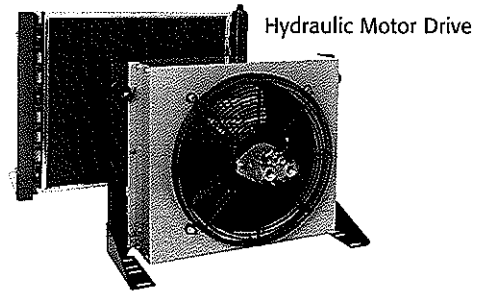
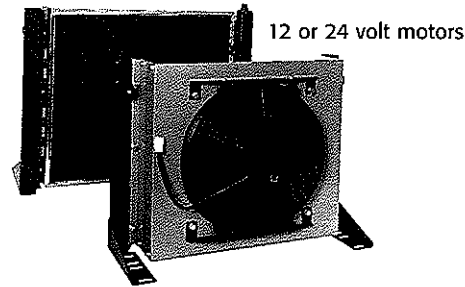
REMOTE MOUNT

**DOES NOT BLOCK MAIN
ENGINE RADIATOR**

**LONG LIFE HYDRAULIC
MOTOR**

REMOTE MOUNT

HEAVY DUTY CONSTRUCTION



- 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 Connections

MATERIALS

- Tubes** - Copper
- Fins** - Aluminum
- Turbulators** - Aluminum
- Fan Blade Assembly** - (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

RATINGS

- Operating pressure** - 300 psi
- Test pressure** - 300 psi
- Operating temperature** - 350°F

RELIEF BYPASS 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

AOC	-	[] []	-	[]	-	[]	-	[]
MODEL SERIES AOC - STANDARD		MODEL SIZE SELECTED		*CONNECTION TYPE		RELIEF BYPASS		SPECIFY MOTOR REQUIRED
				1 = NPT 2 = SAE 3 = BSPP		BLANK = NO BYPASS 30 - 30 PSI 60 - 60 PSI		NM = NO MOTOR 4A - 12 VOLT 4B - 24 VOLT 9 - HYDRAULIC MOTOR

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

SPECIFICATIONS

HYDRAULIC MOTOR DATA

MODEL	NUMBER OF FANS	MAXIMUM FAN SPEED	OIL FLOW REQUIRED PER FAN (GPM)	MINIMUM OPERATING PRESSURE (PSI)	MOTOR (IN ³ /REV) DISPLACEMENT
AOC - 19 thru AOC - 33	1	1725 RPM	1.6	300	.22
AOC - 37 thru AOC - 57	2				
AOC - 70				3.4	500

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

12 AND 24 VOLT DC MOTOR DATA

MODEL	NUMBER OF FANS	FULL LOAD AMPS PER MOTOR		HORSEPOWER PER MOTOR	FAN SPEED	FAN DIAMETER (INCHES)
		12 VOLT	24 VOLT			
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

SELECTION PROCEDURE

Performance Curves are based on 50 SSU 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 or E.T.D.

Step 1. Determine Heat Load.

Heat Load may be expressed as either horsepower or BTU/Hr. To convert horsepower to BTU/Hr: Horsepower x 2545 = BTU/Hr

Step 2. Determine Entering Temperature Difference.

The entering temperature difference is generally the maximum desired oil temperature. Entering oil temperature – Ambient air temperature = E.T.D.

Step 3. Determine Corrected Heat Dissipation to use the curves

BTU/hr heat load x $\frac{50^\circ\text{F}}{\text{E.T.D.}}$ = Corrected Heat Dissipation

Step 4. Enter Curves at oil flow through cooler and curve heat dissipation. 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 Δ P correction curve.

DESIRED RESERVOIR TEMPERATURE

Oil Temperature: Oil coolers can be selected using *entering* or *leaving* oil temperatures.

Off-Line Recirculation Cooling Loop: Desired reservoir temperature is the oil temperature *entering* the cooler.

Return Line Cooling: Desired reservoir temperature is the oil temperature *leaving* the cooler. In this case, the oil temperature change must be determined so that the actual oil *entering*

temperature can be found. Calculate the oil temperature change (oil Δ T) with this formula:

$$\text{Oil } \Delta T = (\text{BTU's/Hr.}) / (\text{GPM Oil Flow} \times 210).$$

To calculate the oil *entering* temperature to the cooler, use this formula:

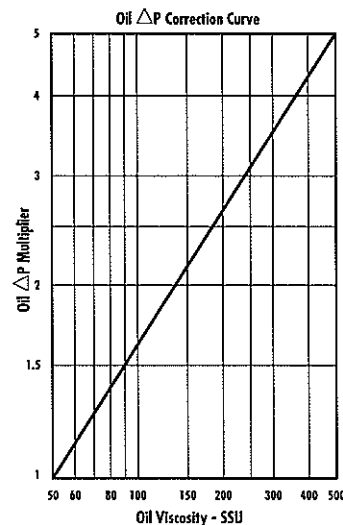
$$\text{Oil Entering Temp.} = \text{Oil Leaving Temp.} + \text{Oil } \Delta T.$$

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:

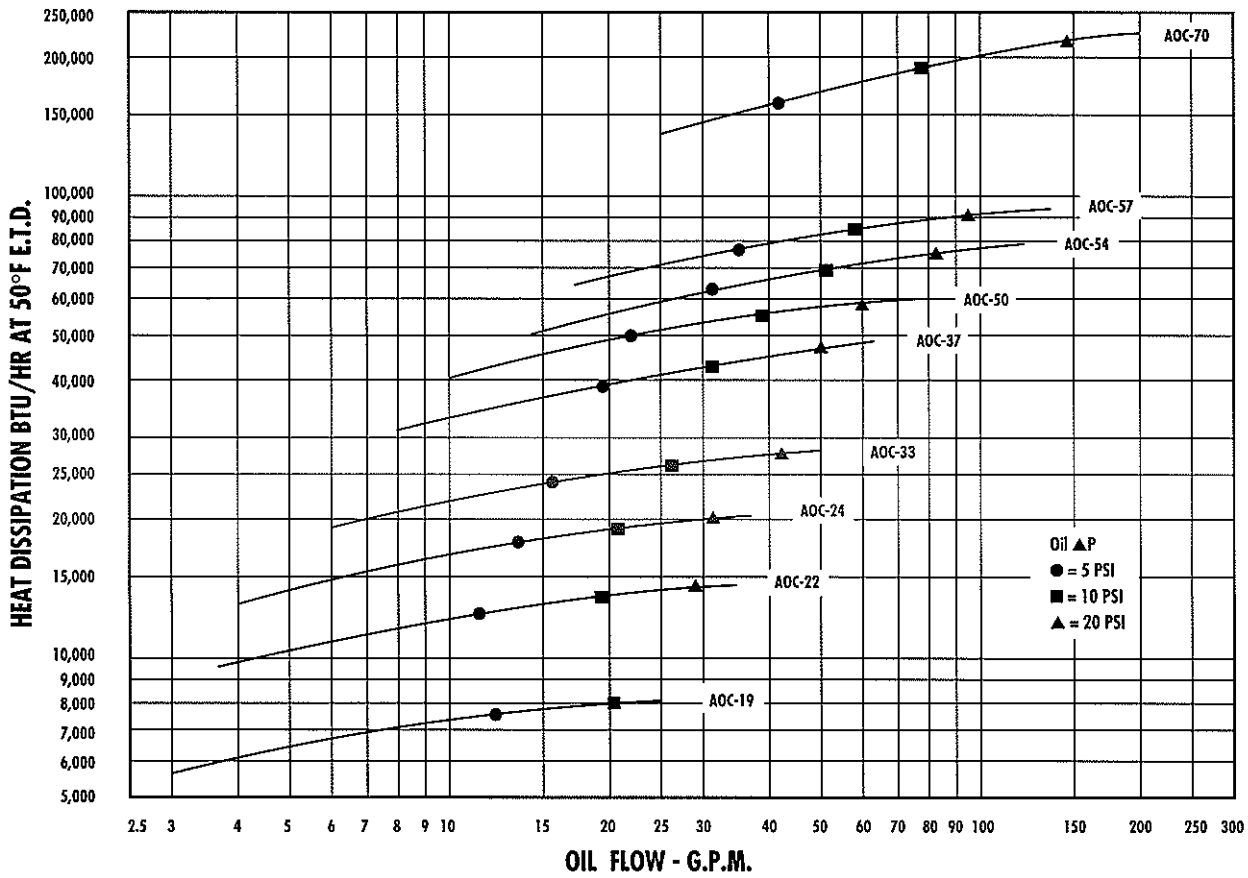
Hydraulic Motor Oil	120° - 180°F
Hydrostatic Drive Oil	160° - 180°F
Engine Lube Oil	180° - 200°
Automatic Transmission Fluid	200° - 300°F



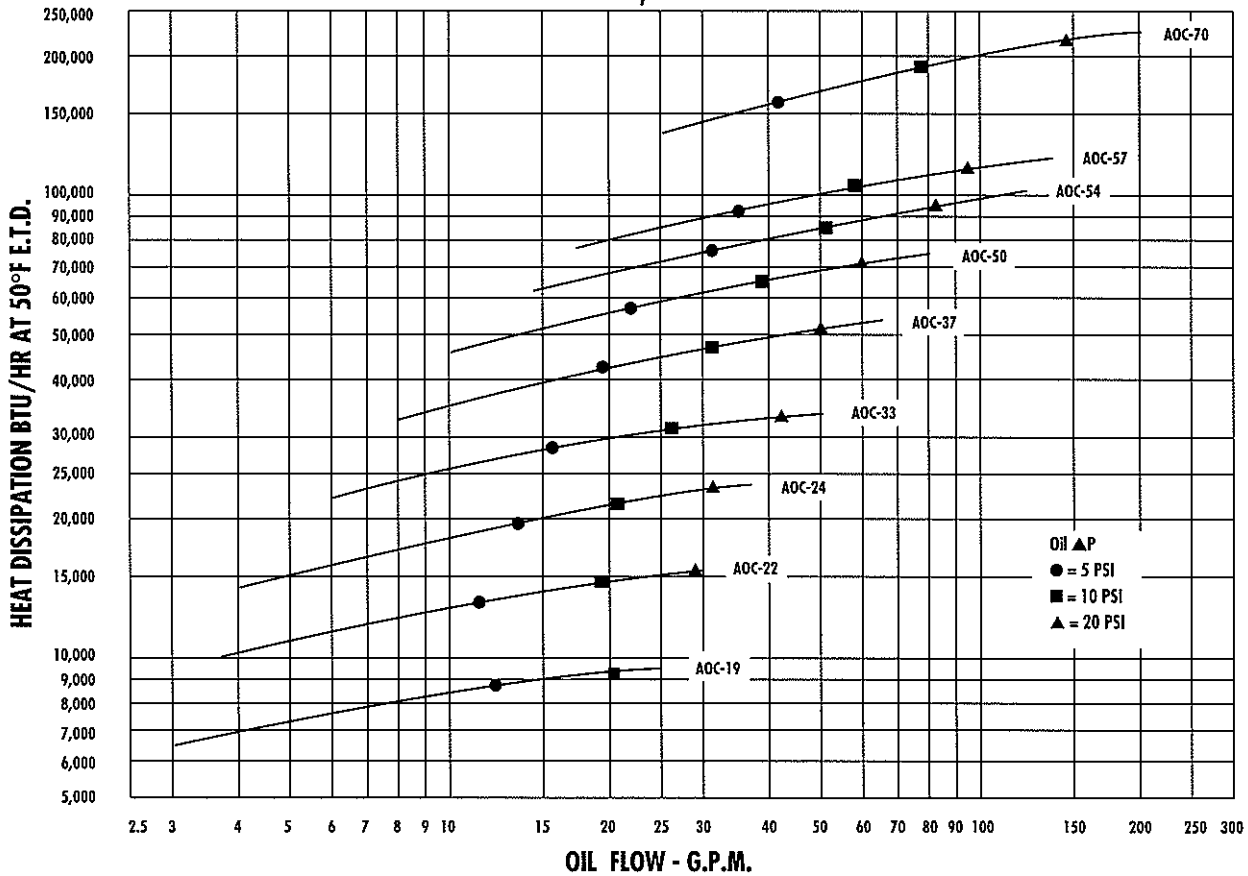
PERFORMANCE CURVES

air cooled
AOC

AOC - with DC Motor



AOC - with Hydraulic Motor



METHODS TO DETERMINE HEAT LOADS

The heat load may be determined by:

- A. Hydraulic oil cooling: Assume 30% of the input horsepower will be rejected to heat. If the input horsepower is unknown, this formula may be used: $BTU/HR = (System\ PSI) \times (GPM\ Flow) \times 1.8 \times .3$
- B. Hydrostatic oil cooling: Assume 25% of the input horsepower will be rejected to heat.
- C. Automatic transmission: Assume 30% of the engine horsepower will be rejected to heat.
- D. Engine oil cooling: Assume 10% of the engine horsepower will be rejected to heat.

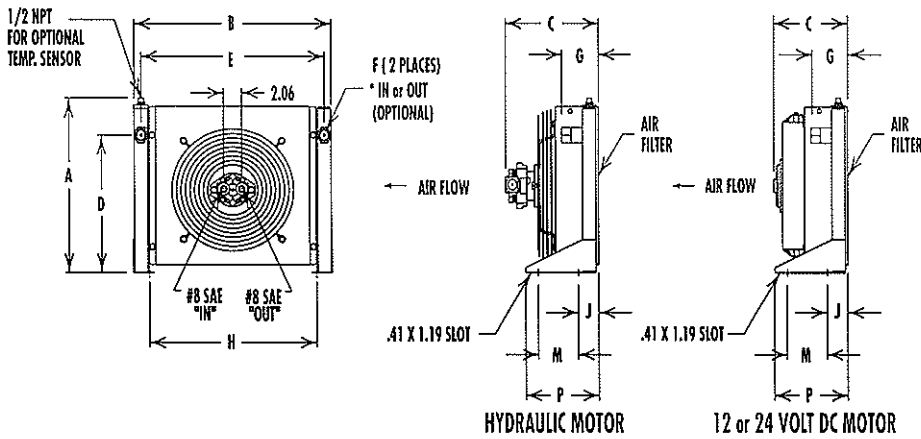
For more information or to purchase these products, please contact:

HYDROTHRIFT CORPORATION
(800) 772-0493

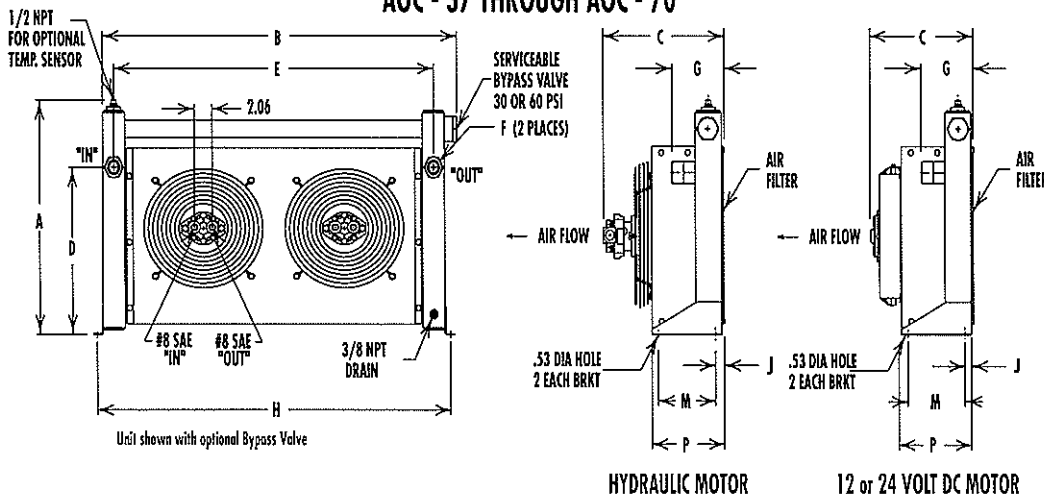
www.hydrothrift.com
sales@hydrothrift.com

DIMENSIONS

AOC - 19 THROUGH AOC - 33



AOC - 37 THROUGH AOC - 70



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	HPT & BSPP	SAE	HPT & 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	#16	1.00	4.34	4.34	21.44	2.61	5.00	8.18	46
AOC-33	25.62	28.00	30.25	31.91			22.31	28.75					26.97				65
AOC-37	18.50	21.38	39.00	40.38	14.06	10.84	15.25	36.50	#20	1.25	4.62	5.97	40.50	1.06	6.50	8.31	95
AOC-50	22.50	25.38	41.00	42.38			19.25	38.50					42.50				1.12
AOC-54	30.50	33.28	42.00	43.38	14.93	15.08	27.25	39.50	#24	1.50	4.89	6.30	43.75	1.87	9.00	12.37	154
AOC-57	36.50	39.38	48.00	49.38			32.75	45.50					49.75				190
AOC-70	38.38	41.25	51.00	52.38	17.79	24.62	34.00	48.50	#32	2.00	8.44	9.91	52.75	1.62	12.12	304	

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.