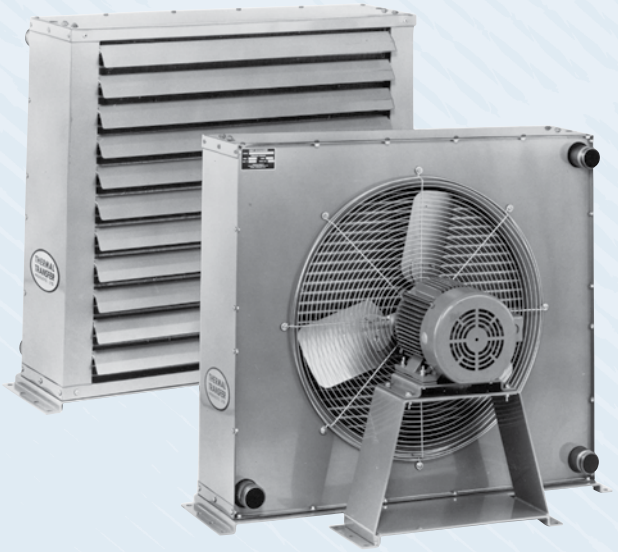
FLUID COOLING | Industrial AOVH Series

FEATURES

- **High Performance AO**
- **High Flow Rates**
- **Compact**
- **One or Two Pass**
- Fluid Power Systems
- Gear Drives
- Injection Molding Machines
- Machine Tools
- Torque Converters
- Hydraulic Presses



OPTIONS

Internal SAE Straight Threads
SAE & Metric Connections
Relief Bypass
Corrosive Resistant
Marine Coating

Ratings

Operating Pressure - 300 psi
Operating Temperature - 400° F

Materials

Tubes Copper
Fins Aluminum
Turbulators Steel
Fan Blade Aluminum with steel hub
Fan Guard Zinc plated steel
Cabinet Steel with baked enamel finish
Manifolds Steel
Connections Steel

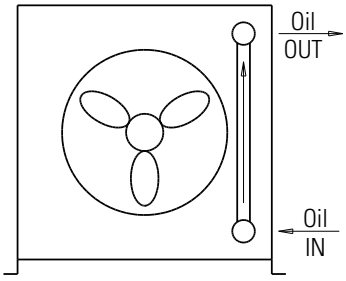
Weights

MODEL	Net Weight (LBS)
AOVHR - 5	67
AOVHR - 10	78
AOVHR - 15	90
AOVHR - 20	110
AOVHR - 25	157
AOVHR - 30	190
AOVHR - 35	315
AOVHR - 40	350

Two Pass Only (Low to Medium Oil Flows)

Model Number	Flow Range GPM (USA)
AOVHR - 5-2	4 - 50
AOVHR - 10-2	4 - 60
AOVHR - 15-2	4 - 60
AOVHR - 20-2	4 - 80
AOVHR - 25-2	4 - 80
AOVHR - 30-2	4 - 80
AOVHR - 35-2	6 - 80
AOVHR - 40-2	8 - 80

AOVHR Series



How to Order

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Model Series
AOVH
AOVHR-Includes Bypass

Model Size Selected

Number of Passes*
Blank - No Bypass
2 - Two Pass Only

Connection Type
Blank - NPT
S - SAE
M - Metric

Relief Bypass Setting*
30-30 psi
60 - 60 psi

Specify Motor Required
Single Phase
Single Phase Expl. Proof
Three Phase
Three Phase 575 Volt
Three Phase Expl. Proof

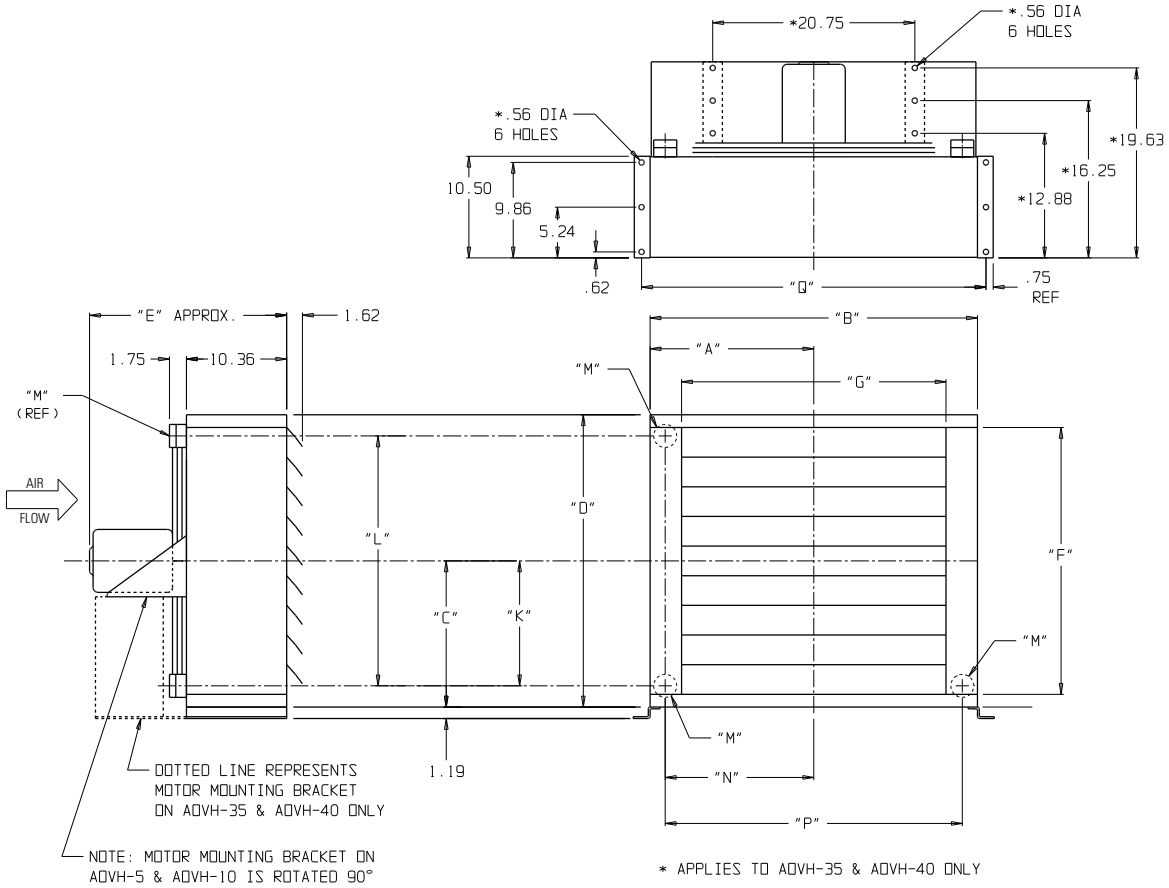
***ADD FOR AOVHR MODELS ONLY:** Relief Bypass Setting & Number of Passes

Dimensions

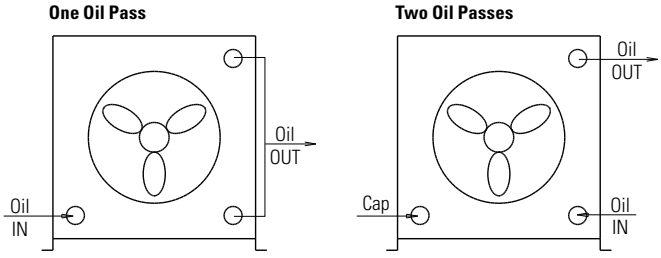
Model	A	B	C	D	E	F	G	K	L	M NPT	M SAE	N	P	Q	Net Wt (Lbs.)
AOVH-5	7.40	14.81	5.90	11.81	19.93	9.19	8.31	3.84	7.69	1-1/2"	#24 SAE 1-7/8-12UN Thread	5.84	11.69	16.81	67
AOVH-10	9.50	19.00	6.56	13.12	19.49	10.50	12.50	4.44	8.88			7.94	15.88	21.00	78
AOVH-15	10.19	20.38	7.87	15.75	19.49	13.12	13.88	5.75	11.50			8.62	17.25	22.38	90
AOVH-20	11.91	23.81	9.19	18.38	19.49	15.75	17.19	7.00	14.00	2"	#32 SAE 2-1/2-12UN Thread	10.28	20.56	25.81	110
AOVH-25	13.34	26.68	11.81	23.62	23.58	21.00	20.19	9.62	19.25			11.78	23.56	28.68	157
AOVH-30	15.81	31.62	13.78	27.56	23.33	24.94	25.12	11.59	23.19			14.25	28.50	33.62	190
AOVH-35	16.90	33.81	15.09	30.19	23.06	27.56	27.31	12.90	25.81			15.34	30.69	35.81	315
AOVH-40	20.81	41.62	18.37	36.75	23.06	34.12	35.12	16.19	32.38			19.25	38.50	43.62	350

NOTE: All dimensions in inches.

Fan Rotation Clockwise/Facing Motor Shaft



Installation Piping Diagram



**See dimension chart for NPT or optional internal SAE connection size.*

Lubrication Notes

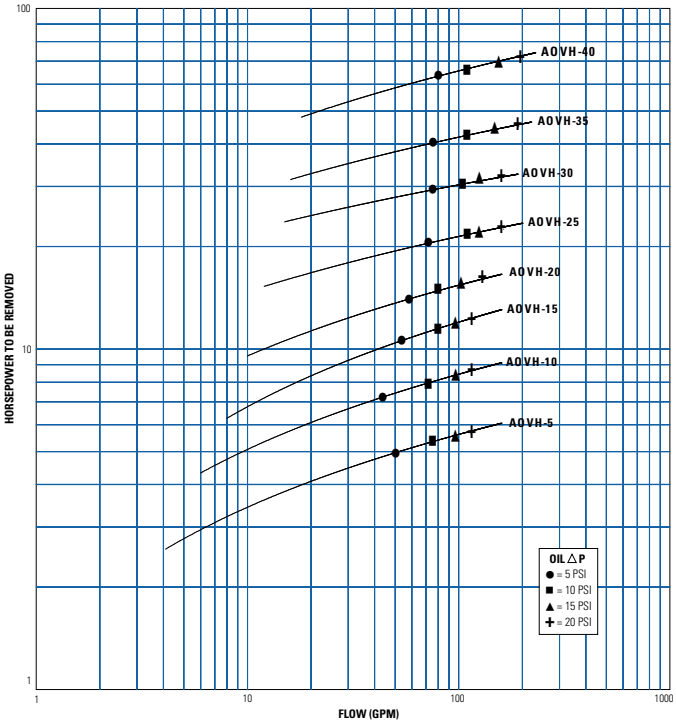
Caution: Do not over oil or over grease.

Ball bearings – No grease needed at start up. Grease as follows:

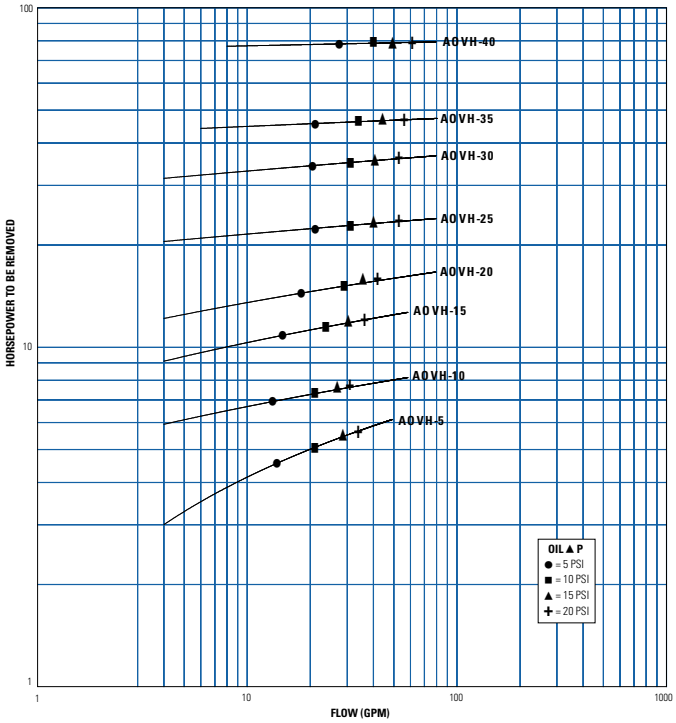
5,000 Hours/Year	5 Year Grease Interval
Continuous Normal Applications	2 Years
Seasonal Service Motor is idle for 6 months or more	1 Year
Continuous High ambients, dirty or moist locations, high vibration	6 Months

Performance Curves

One Pass Oil (AOVH)



Two Pass Oil (AOVH or AOVHR)



Selection Procedure

Performance Curves are based on 50SSU 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 $\frac{40 \times Cv}{\text{Actual Approach}}$ = Curve Horsepower

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

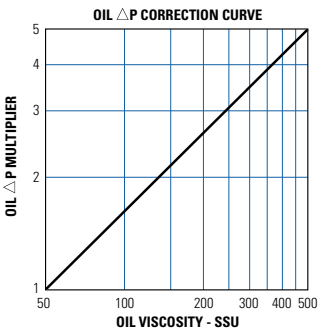
STEP 5 **Determine Oil Pressure Drop from Curves:**
● = 5 PSI; ■ = 10 PSI; ▲ = 15 PSI; ✛ = 20 PSI. Multiply pressure drop from curve by correction factor found in oil △P correction curve.

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 △T) with this formula:
Oil △T = (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 △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

C_V 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	**50-50 Ethylene Glycol & Water**
100	1.14	1.22	1.35	1.58	1.77	1.11
150	1.01	1.05	1.11	1.21	1.31	1.02
200	.99	1.00	1.01	1.08	1.10	.96
250	.95	.98	.99	1.00	1.00	.95

Specifications

Electric motor & Fan data*

Model	CFM	Sound dB(A)** at 7 ft.	Horse Power	Volts	Phase	Full Load Amps	Hz	Nema Frame	RPM	Type	Circuit	Thermal Overload	Bearing B-Ball S-Sleeve
AOVH-5	780	85	1/2	115/208-230 208-230/460	1 3	7.4/3.9-3.7 2.1-2./1.	60 60	48 48	3450 3450	TEFC TEFC	C D	No No	B B
AOVH-10	1110	85	1/2	115/208-230 208-230/460	1 3	7.4/3.9-3.7 2.1-2./1.	60 60	48 48	3450 3450	TEFC TEFC	A D	No	B
AOVH-15	1590	91	1/2	115/208-230 208-230/460	1 3	7.4/3.9-3.7 2.1-2./1.	60 60	48 48	3450 3450	TEFC TEFC	A D	No	B
AOVH-20	2168	91	1/2	115/208-230 208-230/460	1 3	7.4/3.9-3.7 2.1-2./1.	60 60	48 48	3450 3450	TEFC TEFC	C D	No	B
AOVH-25	3000	81	1	115/208-230 208-230/460	1 3	12.4/6.5-6.2 3.6-3.4/1.7	60 60	56 56	1725 1725	TEFC TEFC	C D	No	B
AOVH-30	4095	84	1	115/208-230 208-230/460	1 3	12.4/6.5-6.2 3.6-3.4/1.7	60 60	56 56	1725 1725	TEFC TEFC	C D	No	B
AOVH-35	NOT AVAILABLE				1	9.-8.6/4.3	60	182T	1725	TEFC	D	No	B
	5921	89	3	208-230/460	3								
AOVH-40	NOT AVAILABLE				1	9.-8.6/4.3	60	182T	1725	TEFC	D	No	B
	9609	91	3	208-230/460	3								

**Published electrical ratings are approximate, and may vary because of motor brand. Actual ratings are on motor nameplate.*

***Catalog dB(A) sound levels are at seven (7) feet. dB(A) sound levels increase by six (6) dB(A) for halving this distance and decrease by six (6) dB(A) for doubling this distance.*

Explosion Proof Motors (Class I GP.D & Class II GP.F, G)*

Model	CFM	Sound dB(A)** at 7 ft.	Horse Power	Volts	Phase	Full Load Amps	Hz	Nema Frame	RPM	Type	Circuit	Thermal Overload	Bearing B-Ball S-Sleeve
AOVH-5	780	85	1/2	115/230 208-230/460	1 3	7.4/3.7 2.4-2.2/1.1	60	48	3450	FC	C D	Yes	B
AOVH-10	1110	85	1/2	115/230 208-230/460	1 3	7.4/3.7 2.4-2.2/1.1	60	48	3450	FC	C D	Yes	B
AOVH-15	1590	91	1/2	115/230 208-230/460	1 3	7.4/3.79 2.4-2.2/1.1	60	48	3450	FC	C D	Yes	B
AOVH-20	2168	91	1/2	115/230 208-230/460	1 3	7.4/3.79 2.4-2.2/1.1	60	48	3450	FC	C D	Yes	B
AOVH-25	3000	81	1	115/230 230/460	1▲ 3	12.4/6.2 3.4/1.7	60	56	1725	FC	C D	Yes No	B
AOVH-30	4095	84	1	115/230 230/460	1▲ 3	12.4/6.2 3.4/1.7	60	56	1725	FC	C D	Yes No	B
AOVH-35	NOT AVAILABLE				1	8.6/4.3	60	182T	1725	FC	D	No	B
	5921	89	3	230/460	3								
AOVH-40	NOT AVAILABLE				1	8.6/4.3	60	182T	1725	FC	D	No	B
	9609	91	3	230/460	3								

**Published electrical ratings are approximate, and may vary because of motor brand. Actual ratings are on motor nameplate.*

▲ = CL. 1, GP. D only **TEFC** = Totally enclosed, fan cooled **FC** = Fan cooled **C** = Capacitor start - Induction run **D** = Squirrel cage