



# OAO

## Air Oil Cooler

*High performance*

*Small size*

*Solid construction*

*An air oil cooler ready for installation  
with integrated pump for off-line cooling and filter circuits*

## The new OAO cooling system, developed through extensive research and years of experience

for off-line cooling and filtration circuits



*Designed by hydraulic engineers for use in modern hydraulic systems, the compact OAO cooler system has high cooling capacities and operates quietly. The circulation pump in the system is integrated with the fan motor. The pump consists of a gerotor unit, which assures a quiet operation, prolonged life and a drastic reduction in maintenance costs. They are available in several models and sizes for use in hydraulic systems with installed powers from 15 HP to 400 HP*

### Typical applications for **OAO**

- High return flows (25 GPM - 400 GPM) from the hydraulic systems but low cooling requirements (2.5 HP - 7 HP) in relation to the return flow.
- Irregular return flows or pressure peaks in return lines.
- Cooling systems for all sizes of Gear boxes
- Lube oil cooling systems
- Ideal for old hydraulic systems without changing present piping.
- Hydraulic presses
- Machine tools

### Advantages

Filtering in separate circuits is becoming increasingly common because continuous pressure and flow variations in the pressure and return lines make effective filtering very difficult. Inserting the filter into the cooling circuit, (creating a "Kidney Loop") allows the OAO cooler to cool and filter continuously. In addition, the working temperature is regulated by adding a thermo by-pass valve. This combination gives a more reliable and robust performance to the system.

### The advantages of the OilAir off-line cooling system are:

- Low cost
- Minimum component parts
- Compact and solid cooling system
- Optimum cooling capacity
- Uniform flow
- High performance
- OilAir OAQPM low pressure pump - "Q" for quiet!

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## Technical Specifications for OAO Cooler Matrix

- Dynamic working pressure 200 psig. Tested with 5 million pressure cycles at 3 Hz at Temperature of 120° F.
- Maximum static pressure 300 psig
- Temperature shock tested with steam 248° F and Water 55° F.
- Heat transfer tolerance +/- 6%
- Maximum oil inlet temperature 248° F. High Temperatures cause reduction in pressure rating. Please consult OilAir Hydraulics.
- Higher viscosity's than 450 SSU cause reduction in cooling capacity. Please consult OilAir Hydraulics.
- Coating: Protective diffused zinc coating over the entire surface.
- Environment: For aggressive atmosphere, check with OilAir Hydraulics Inc.

## Technical Specifications for Electrical Motors

Standard electrical motors for OAI air oil coolers are 3 phase asynchronous motors according to the specifications of NEMA standards.

- Standard operating voltages: Normal Voltage 208-230/460V, 60 HZ. Other voltages, frequencies and single phase. Motors are available on request.
- Insulation: Class F.
- Temperature Rating 104° F ambient condition.
- Service factor: 1.15
- UL Listed.
- High efficiency motor.
- Explosion proof motors available upon request.

## Technical Specifications for Pump

- Anodized aluminum pump housing and cover.
- Aluminum bell housing and flexible coupling.
- Nitrile rubber seals and O-rings.
- Maximum suction height 16 feet.
- Maximum fluid temperature may not exceed 200° F
- Sintered steel gerotor
- Pump Pressure 60 PSI at 600 SSU. Fluid for higher pressures consult OilAir Hydraulics.

## Noise Level

The noise level test for the OAO coolers is conducted In accordance with ANSI S12.43-1997. Values stated in the table are measured at a distance of 1 meter.



Fluid compatibility with OAO aluminum cooler.

*Most Mineral Oils*

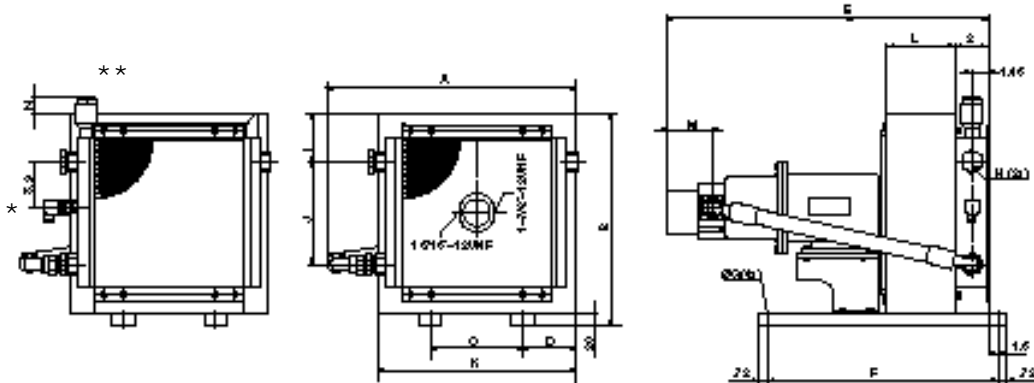
*Most Synthetic Oils*

*Most Vegetable Oils*

**OAQEGO Material**

Matrix: *Aluminum*  
 Fan blades: *Fiber glass reinforced polypropylene*  
 Fan housing: *Steel*  
 Fan guard: *Steel*  
 Pump Housing: *Cast Aluminum.*  
 Other parts: *Steel, electronic blast coated with Epoxy plastic powder.*

TYPE	Heat dissipation BTU/HR/°F (ETD)	Heat Dissipation BTU/HR/@50°F ETD	Nominal Oil flow (GPM)	Noise Level +/- 3dB(A) Accoustic Pressure L <sub>PA</sub>	Air flow SCFM	Electro-motor Poles-HP	Fan Diameter (In)	Weight (LBS)
OAO 07-4-1-6	280	14000	6.34	71	662	4-1	12.79	67
OAO 07-4-1-12	320	16000	12.68	71	662	4-1	12.79	68
OAO 07-4-2-19	360	18000	19.02	72	662	4-2	12.79	82
OAO 07-4-2-25	370	18500	25.36	72	662	4-2	12.79	83
OAO 11-4-1-6	430	21500	6.34	74	1150	4-1	15.74	78
OAO 11-4-1-12	510	25500	12.68	74	1150	4-1	15.74	79
OAO 11-6-1.5-12	440	22000	12.68	65	810	6-1.5	15.74	91
OAO 11-6-1.5-17	480	24000	17.44	65	810	6-1.5	15.74	92
OAO 11-4-2-19	580	29000	19.02	75	1150	4-2	15.74	93
OAO 11-4-2-25	600	30000	25.36	75	1150	4-2	15.74	94
OAO 16-4-2-6	595	29750	6.34	77	1930	4-2	17.95	85
OAO 16-4-2-12	750	37500	12.68	77	1930	4-2	17.95	85
OAO 16-6-1.5-12	610	30500	12.68	67	1270	6-1.5	17.95	86
OAO 16-6-1.5-17	660	33000	17.44	67	1270	6-1.5	17.95	88
OAO 16-4-2-19	860	43000	19.02	78	1930	4-2	17.95	88
OAO 16-4-2-25	900	45000	25.36	78	1930	4-2	17.95	89
OAO 23-4-2-12	1000	50000	12.68	82	2960	4-2	21.18	105
OAO 23-6-1.5-12	850	42500	12.68	71	1940	6-1.5	21.18	104
OAO 23-6-2-17	920	46000	17.44	71	1940	6-2	21.18	151
OAO 23-4-3-19	1250	62500	19.02	82	2960	4-3	21.18	149
OAO 23-4-3-25	1400	70000	25.36	82	2960	4-3	21.18	150
OAO 33-6-3-17	1650	82500	17.44	80	3280	6-3	25.59	158
OAO 33-4-5-19	1900	95000	19.02	89	4830	4-5	25.59	137
OAO 33-4-5-25	2250	112500	25.36	89	4830	4-5	25.59	138
OAO 44-6-3-17	1850	92500	17.44	79	4010	6-3	25.59	186
OAO 44-4-5-19	2350	117500	19.02	90	6180	4-5	25.59	166
OAO 44-4-5-25	2550	127500	25.36	90	6180	4-5	25.59	167

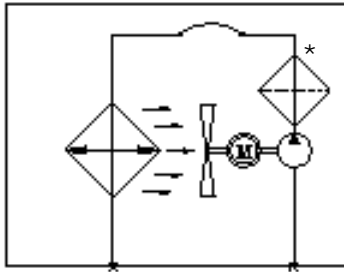


\* thermo switch protection against too high oil temperature

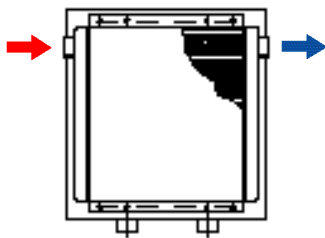
\*\* By-pass, type BP

TYPE	A (In)	B (In)	C (In)	D (In)	E (In)	F (In)	G (In)	H SAE	I (In)	J (In)	K (In)	L (In)	M (In)	N (In)
OAO 07-4-1-6	19.02	15.55	7.99	3.18	28 1/2	20.07	0.35	1 5/16" -12UN	4.05	6.29	14.37	4.92	2.44	1.65
OAO 07-4-1-12	19.02	15.55	7.99	3.18	29	20.07	0.35	1 5/16" -12UN	4.05	6.29	14.37	4.92	2.95	1.65
OAO 07-4-2-19	19.02	15.55	7.99	3.18	30 3/4	20.07	0.35	1 5/16" -12UN	4.05	6.29	14.37	4.92	3.43	1.65
OAO 07-4-2-25	19.02	15.55	7.99	3.18	31 1/4	20.07	0.35	1 5/16" -12UN	4.05	6.29	14.37	4.92	3.94	1.65
OAO 11-4-1-6	21.77	18.50	7.99	4.66	29 1/2	20.07	0.35	1 5/16" -12UN	4.17	8.93	17.32	5.91	2.44	1.50
OAO 11-4-1-12	21.77	18.50	7.99	4.66	30	20.07	0.35	1 5/16" -12UN	4.17	8.93	17.32	5.91	2.95	1.50
OAO 11-6-1.5-12	21.77	18.50	7.99	4.66	31 3/4	20.07	0.35	1 5/16" -12UN	4.17	8.93	17.32	5.91	3.43	1.50
OAO 11-6-1.5-17	21.77	18.50	7.99	4.66	32 1/4	20.07	0.35	1 5/16" -12UN	4.17	8.93	17.32	5.91	3.94	1.50
OAO 11-4-2-19	21.77	18.50	7.99	4.66	31 3/4	20.07	0.35	1 5/16" -12UN	4.17	8.93	17.32	5.91	3.43	1.50
OAO 11-4-2-25	21.77	18.50	7.99	4.66	32 1/4	20.07	0.35	1 5/16" -12UN	4.17	8.93	17.32	5.91	3.94	1.50
OAO 16-4-2-6	24.29	20.71	7.99	5.76	31 3/4	20.07	0.35	1 5/16" -12UN	3.94	9.00	19.53	6.89	2.44	1.73
OAO 16-4-2-12	24.29	20.71	7.99	5.76	32 1/4	20.07	0.35	1 5/16" -12UN	3.94	9.00	19.53	6.89	2.95	1.73
OAO 16-6-1.5-12	24.29	20.71	7.99	5.76	32 3/4	20.07	0.35	1 5/16" -12UN	3.94	9.00	19.53	6.89	3.43	1.73
OAO 16-6-1.5-17	24.29	20.71	7.99	5.76	33 1/4	20.07	0.35	1 5/16" -12UN	3.94	9.00	19.53	6.89	3.94	1.73
OAO 16-4-2-19	24.29	20.71	7.99	5.76	32 3/4	20.07	0.35	1 5/16" -12UN	3.94	9.00	19.53	6.89	3.43	1.73
OAO 16-4-2-25	24.29	20.71	7.99	5.76	33 1/4	20.07	0.35	1 5/16" -12UN	3.94	9.00	19.53	6.89	3.94	1.73
OAO 23-4-2-12	27.40	24.02	14.01	4.41	33 1/4	24.01	0.55	1 5/16" -12UN	3.98	12.00	22.83	7.87	2.95	1.69
OAO 23-6-1.5-12	27.40	24.02	14.01	4.41	33 3/4	24.01	0.55	1 5/16" -12UN	3.98	12.00	22.83	7.87	3.43	1.69
OAO 23-6-2-17	27.40	24.02	14.01	4.41	38 1/4	24.01	0.55	1 5/16" -12UN	3.98	12.00	22.83	7.87	3.94	1.69
OAO 23-4-3-19	27.40	24.02	14.01	4.41	37	24.01	0.55	1 5/16" -12UN	3.98	12.00	22.83	7.87	3.43	1.69
OAO 23-4-3-25	27.40	24.02	14.01	4.41	37 1/4	24.01	0.55	1 5/16" -12UN	3.98	12.00	22.83	7.87	3.94	1.69
OAO 33-6-3-17	31.34	28.43	14.01	6.61	41 1/4	24.01	0.55	1 5/8" -12UN	4.06	15.98	27.24	8.86	3.94	1.65
OAO 33-4-4-19	31.34	28.43	14.01	6.61	40 3/4	24.01	0.55	1 5/8" -12UN	4.06	15.98	27.24	8.86	3.43	1.65
OAO 33-4-4-25	31.34	28.43	14.01	6.61	39 1/4	24.01	0.55	1 5/8" -12UN	4.06	15.98	27.24	8.86	3.94	1.65
OAO 44-6-3-17	31.34	34.09	14.01	6.61	42 1/4	24.01	0.55	1 5/8" -12UN	3.43	23.00	27.24	9.84	3.94	2.28
OAO 44-4-4-19	1.34	34.09	14.01	6.61	39 3/4	24.01	0.55	1 5/8" -12UN	3.43	23.00	27.24	9.84	3.43	2.28
OAO 44-4-4-25	31.34	34.09	14.01	6.61	40 1/4	24.01	0.55	1 5/8" -12UN	3.43	23.00	27.24	9.84	3.94	2.28

Type BPO



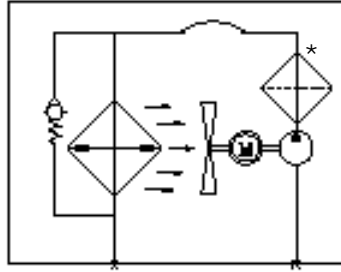
OAQ 07  
Type BPO



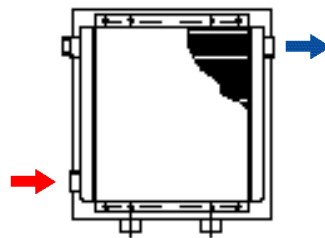
\* Recommended location of a filter

Oil inlet connection is located on the left side of the matrix. The oil outlet connection is always located on the opposite side of the matrix.

Built in By-Pass Valve Model BP1

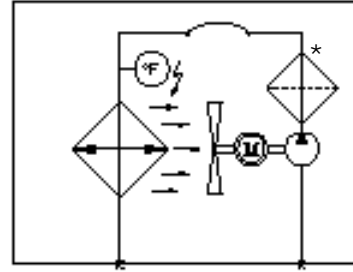


OAQ 11-44  
Type BPO

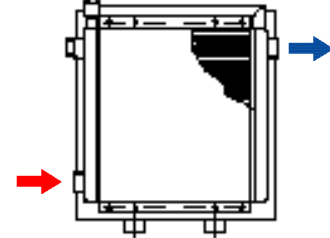


Oil inlet connection is located on the left side of the matrix. The oil outlet connection is always located on the opposite side. There are two connections on the left side, one of which must be plugged.

With Thermo Contact, type C



OAQ 11-44  
Type BP1 and BP2



Oil inlet connection is located on the left side of the matrix. The oil outlet connection is always located on the opposite side. There are two connections on the left side, one of which must be plugged.

### Model Code

OAQ 33 - x - x - 19 - x - x

Cooler Size

No: of Poles

Electromotor

4-Poles 1800 rpm

6-Poles 1200 rpm

Electromotor

Capacity

Pump flow GPM

Thermo-contacts available:

Temp 100/120/160/175 °F

C100 = With Thermo-contact set at 100°F

Type of by-pass valve

BPO = Without

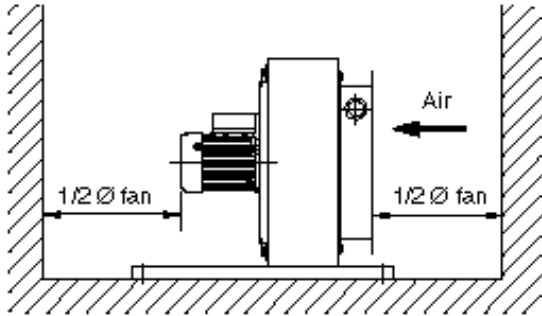
BP1.2 = With built-in-by-pass valve 30 psi

BP2.50 = With built-in thermo-by-pass valve. Completely shut at 120°F. Thereafter By-pass function. (Opening pressure 30 psi)

Ordering Example: OAQego 33 - 4 - 5 - 19 - BP1.2 - C100

# Service instructions

## Location



Place the cooler so that there is an unrestricted air flow to and from the cooler. The distance from the nearest wall should not be less than half the diameter of the fan.

## Cleaning of air fins

The easiest way to clean the air fins is by using compressed air or rinsing with water. Fouling can be dealt with using a degreasing agent and a high pressure washing system. When using a high pressure washing system, point the jet carefully parallel to the air fins.

### Useful Technical Information

*Recommended Maximum Oil Temperature:*

Industrial Hydraulic Systems:	110°F - 130°F
Mobile Hydraulic Systems:	130°F - 150°F
Mobile Hydrostatic Transmission:	160°F - 170°F

*Formulas*

1 HP	=	746 Watts	=	2545 Btu/hr
1 kW	=	1.34 HP	=	3412 Btu/hr
Temperature conversion °F	=	°C x 1.8 +32		

*Heat Generated in a System*

HP heat	=	(PSI x GPM)/1714
BTU/hr heat generation	=	1.5 x PSI x GPM

*Heat Radiation from Steel Reservoirs*

HP Radiation	=	.001 x T.D. x A
Where	A	= Surface area in Sq. Ft.
	TD	= Temperature difference in °F Between reservoir surface and surrounding air

## Cleaning the inside of oil cooling tubes

Connect the cooler to a closed circuit and flush the inside with perchlorethylene. After cleaning, the radiator should be flushed with oil before reconnecting to the hydraulic system.

## Noise level

The noise level of the oil cooler may vary within +/-3 dB (A) depending on reflections from surrounding objects, natural frequency and other interference sources etc.

## Suspension

The very rigid cooler construction permits both vertical and horizontal mounting. Mounting is facilitated by four mounting holes in each support leg of the cooler. There is a mounting flange in the front of the air oil cooler for wall mounting next to a ventilator shaft or similar structure.

## Connection to the system

Use hydraulic hoses both to and from the cooler. Avoid hydraulic tubes, unless stress-free joints can be guaranteed.

### Examples

<i>Given:</i>	Fluid Type	SAE 10
	Desired Oil Temperature	130°F
	Ambient Air Temperature	80°F
	Altitude	<3,000 feet
	Heat Dissipation Required	20,000 Btu/hr

*Required:* Type of QEGO air oil cooler

Temperature Difference ( T )	( T ) = 130°F - 80°F = 50°F
Heat dissipation per °F ( P )	= 20,000/50
	P = 400 Btu/hr/°F

Refer to the chart on page 4

An OAQEGO 11-4-1-6 has a heat dissipation of 430 Btu/hr/°F

This cooler with 50°F ETD will dissipate 21500 Btu/hr

Therefore we recommend Cooler model #OAQ 11-4-1-6  
Alternatively you may select 11-6-1.5-12 for lower noise levels



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