

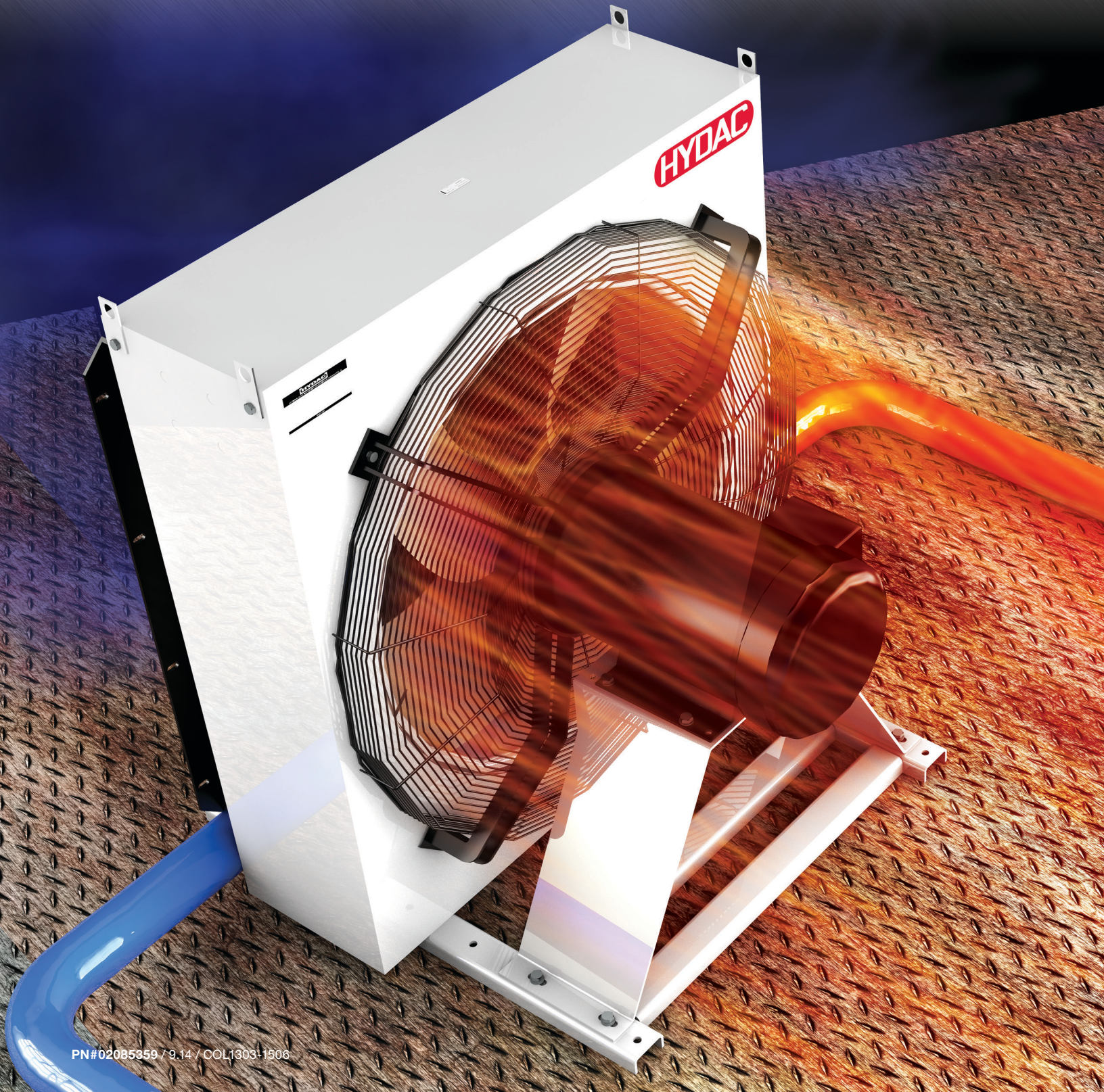
**HYDAC**

**INTERNATIONAL**



## Standard Coolers

Air Cooled / Liquid Cooled





HYDAC stands for worldwide presence and accessibility to the customer. With more than 7,000 employees, 50 overseas subsidiaries and 500 plus sales and service partners worldwide, we are in close contact with our customers, providing engineering advice, production support, expert installation and superior service. HYDAC has been active in the field of hydraulic and lube filtration for more than 50 years and has become one of the leaders in innovative filtration products in hydraulics and lube oil systems. No matter what the job entails and irrespective of location, we are able to help you find the best solution—we've got you covered.

## HYDAC Products



Our product range extends from air to water oil coolers and cooling systems. HYDAC is capable of integrating products into cooler solutions for both industrial and mobile applications.



## HYDAC Quality



HYDAC stands for quality and customer satisfaction. We are certified to ISO 9001:2008 and can supply our products with certification if required. To ensure that our products are as innovative as possible, they are developed, manufactured, and tested by qualified personnel using advanced technology.



## HYDAC Customer Service



Our internal staff and worldwide distribution network take care of the important matter of customer service. HYDAC values high standards, professional ethics, and mutual respect in all transactions with customers, vendors, and employees. We invest in our relationships by providing expertise, quality, dependability, and accessibility to foster growth and a sense of partnership. Our customer service representatives are committed to serving the customers' needs.



### Energy and Environmental Technology

HYDAC products play a key role in providing innovative developments in hydroelectric, heating, wind, and waste power plants. HYDAC has vast expertise in solvent and waste water processing technologies.



### Offshore Shipbuilding and Marine Technology

Maritime technology places special demands on material functionality and reliability. HYDAC cooling products can be designed to meet these demands due to our high quality and test standards. HYDAC coolers have been applied under the toughest conditions from drilling rigs to deep sea applications.



### Mobile Market

The aim of our engineers has always been to reduce volume and weight, resulting in increased product performance. HYDAC provides high performance coolers for the mobile market, which can be found on construction, forestry, and agricultural equipment.



### Industrial Engineering

Since we began, HYDAC has been involved in many industrial engineering applications. Our knowledge and expertise of many industries provides a comprehensive range of cooling products. HYDAC offers custom cooling solutions for machine tools, plastic injection molding machines, test equipment, presses, and welding robots. Other industrial applications include: steel and heavy industry, power transmissions, and paper mills.

# HYDAC Standard Coolers Overview

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Air Cooled Accessories

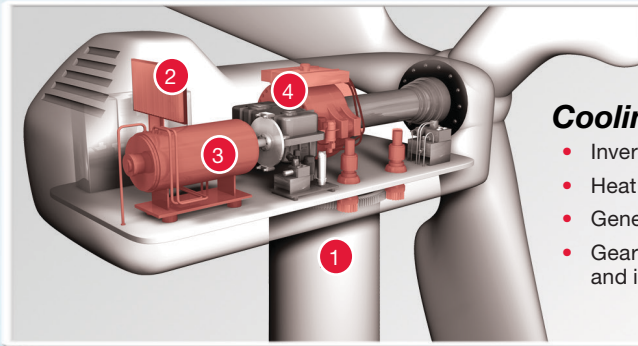
56

HEX Series (Plate Heat Exchanger)

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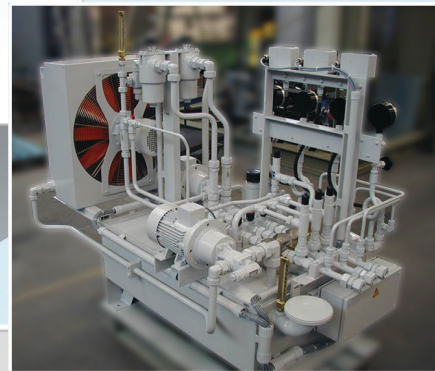
### **Cooling Solutions for Wind Energy**

- Inverter cooling
- Heat exchangers & coolers
- Generator cooling
- Gear cooling, lubrication and inline filtration



### **Cooling Solutions for Power Generation**

- Power Plant
- Cooling Tower
- Gas Turbine



### **Cooling Solutions for Industrial Applications**

- Industrial
- Elevators
- Shipbuilding
- Heavy Industry
- Gearboxes
- Test Stands

### **Mobile Applications**

- Agricultural
- Construction
- Railways
- Environmental Control
- Cranes
- Forestry Equipment
- Commercial Vehicles
  - Firetruck
  - Cement Truck
  - Utility Truck
  - Forklift

# Advantages

The advantages of an off line cooling system are a stable cooling and filtration performance irrespective of variations in flow and duty cycle of the main hydraulic circuit. This allows the cooler to be sized to fit the heat load and not the maximum return flow of the main circuit. A further advantage is that the offline cooler is completely isolated from surge pressures in the return line that can potentially damage the cooler. Also, maintenance can be performed on the filters without having to shut down the main system.

# Selection Requirements

The following parameters need to be known to correctly size a cooler:

- How much heat needs to be removed from the system?
- What is the desired oil temperature?
- What is the supplied water temperature and ambient air temperature?
- What is the flow required?
- What is the desired oil to water flow ratio?
- What is the viscosity of the oil?

## 1. Required Flow

As a rule of thumb, the pump should be sized so that it circulates approximately 25 to 30% of the reservoir's capacity.

Note: Before sizing the heat exchanger, the flow rate needs to be known.

## 2. Heat Removed

The main function of the cooler is to transfer heat from the oil into the water or air. Heat load is generally described in units of HP, kW, or BTU's/Hr being removed. When designing a new system, a good rule of thumb is a cooler should be sized to remove approximately 25 to 30% of the input HP or kW.

In an existing system with a heat problem and the heat load is not known, a heat load test needs to be performed. The test is performed by measuring the temperature rise of the oil over a certain period of time. Take this temperature rise and time in minutes and use it in the following formula to determine the kW heat load.

$$\text{Heat Load } P_v = \text{Temperature rise (}^\circ\text{C)} \times \text{Specific Heat (1.88 KJ/Kgk)} \times \text{Density of oil (0.951 Kg/l)} \times \text{Volume (l)} \\ \text{Operating time (Minutes)} \times 60$$

$$\text{HP} = \text{kW} \times 1.341$$

See example of heat load calculation below.

## 3. Oil/Water Temperatures

The inlet oil temperature is the desired temperature of the oil in the reservoir. The inlet water temperature is the water temperature entering the cooler unit.

## 4. Flow Ratio

Maximum capacity of a cooler is achieved when the oil to water ratio is 1:1. This is desirable where the water supply is plentiful, as this will be the smallest, least expensive cooler. As the ratio increases, the cooling capacity decreases and a larger cooler will be required. This option costs more initially, but will save on water usage.

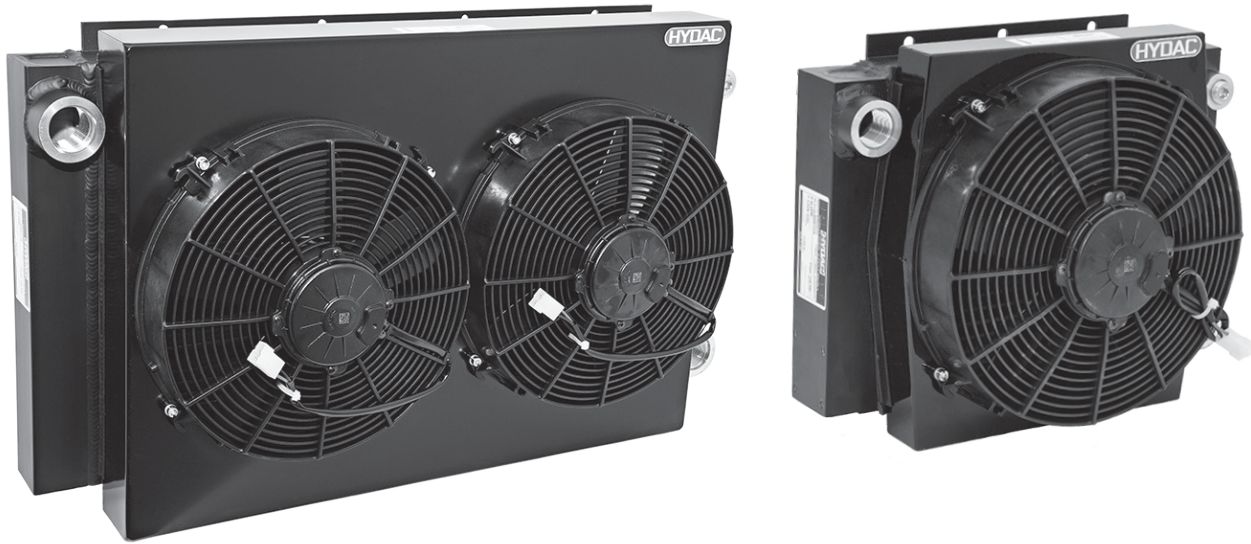
## Heat Load Calculation Example

$P_v$ (Heat Load)	=	kW	$P_v = \frac{\Delta T \times SH_{oil} \times SG_{oil} \times V}{t \times 60} = \text{kW}$
$\Delta T$ (Temperature Rise)	=	34.4°C (93.9°F)	
SH (Specific Heat of oil)	=	1.88 KJ/Kgk	$P_v = \frac{34.4 \times 1.88 \times 0.915 \times 380}{45 \times 60} = 8.32 \text{ kW}$
SG (Specific Gravity of oil)	=	0.915 Kg/l	
V (Tank Volume)	=	380 l (100 Gal)	HP = 8.32 x 1.341 = 11.16
t (Time in Minutes)	=	45 min.	Heat to be removed = 11.16 HP



# ELD Series - DC Motor Drive

Air Cooled Oil Coolers for Mobile Applications



## Description

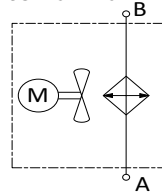
These coolers use a combination of high performance cooling elements and long life DC electrical powered fans to give extended trouble free operation in mobile hydraulic applications. The compact design allows the coolers to fit most equipment and provides the highest cooling performance in heat dissipation while minimizing space required.

## Features

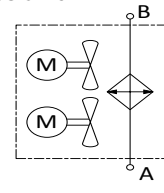
- Most coolers are designed with the inlet/outlet ports facing toward the back to help reduce fittings
- All coolers feature a built in thermostat port
- 12 and 24 volt DC fans
- Up to 47 HP cooling capacity
- Rated flows up to 47 gpm
- Motor lifetimes up to 10,000 hours
- Available with internal pressure or thermal bypass

## Hydraulic Symbol

Sizes 1.5 - 4.5



Sizes 5 - 6



## Applications



Agricultural



Automotive



Construction



Utility



Railways



Material Handling



Forrestry

## General

	<b>Housing</b>	Welded Steel
	<b>Heat Exchanger</b>	Aluminum Heavy Duty Bar and Plate
	<b>Fan</b>	Plastic
<b>Mounting Orientation</b>		Any Orientation
<b>Maximum Pressure</b>		230 psi (16 Bar)
<b>Fluids</b>		Mineral oil to DIN 51524 Part 1 and 2
<b>Ambient Temperature</b>		50° - 104°F (10° - 40°C)
<b>Maximum Oil Temperature</b>		266°F (130°C)
<b>Standard Airflow Direction</b>		Air pulled across heat exchanger
<b>Filtration</b>		ISO/DIS 4406 Code 19/16- Filtration Grade B25>75
<b>Environmental Protection Class</b>		IP68
<b>Standard Fan Connector</b>		AMP Code 180908





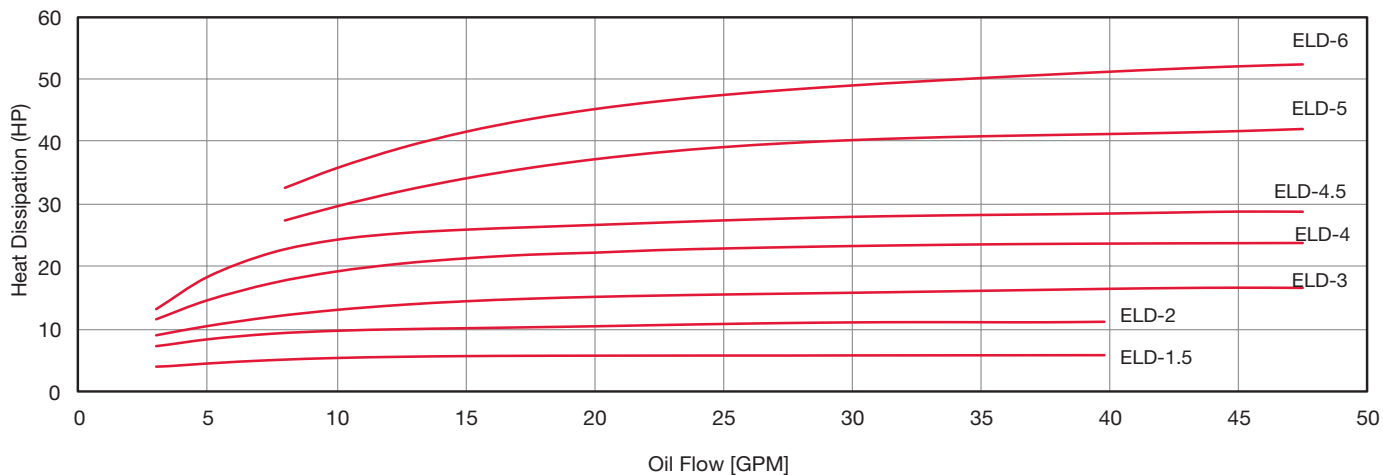
# ELD Series

## Heat Dissipation

Cooling capacity depending on oil flow and the temperature differential  $\Delta T$  between the oil inlet and air temperature.

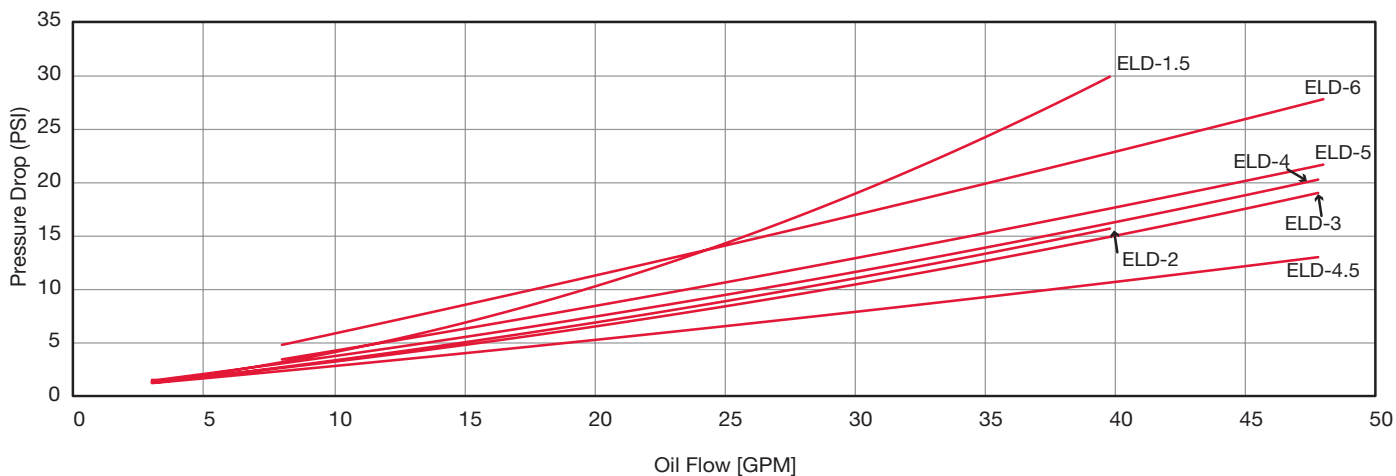
### Heat Dissipation @ $\Delta T = 72^\circ\text{F}$

(Tolerance:  $\pm 5\%$ )



### Pressure Drop @ 30 cSt

(Tolerance:  $\pm 5\%$ )



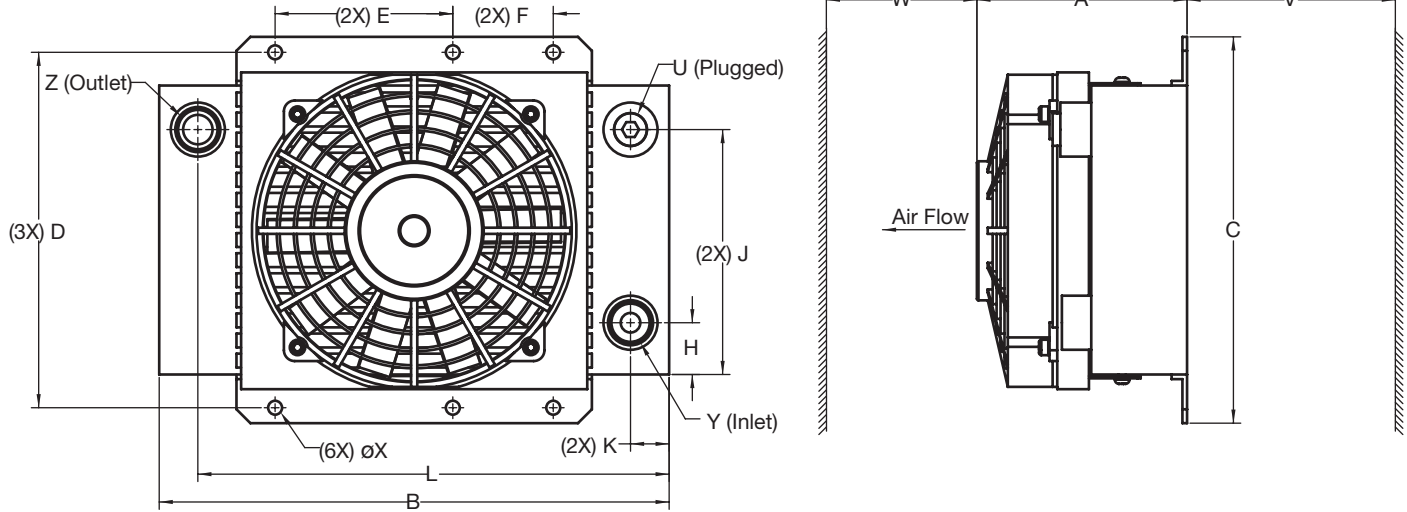
For other viscosities, the result must be multiplied by the K factors below

### K Factor Chart

Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3

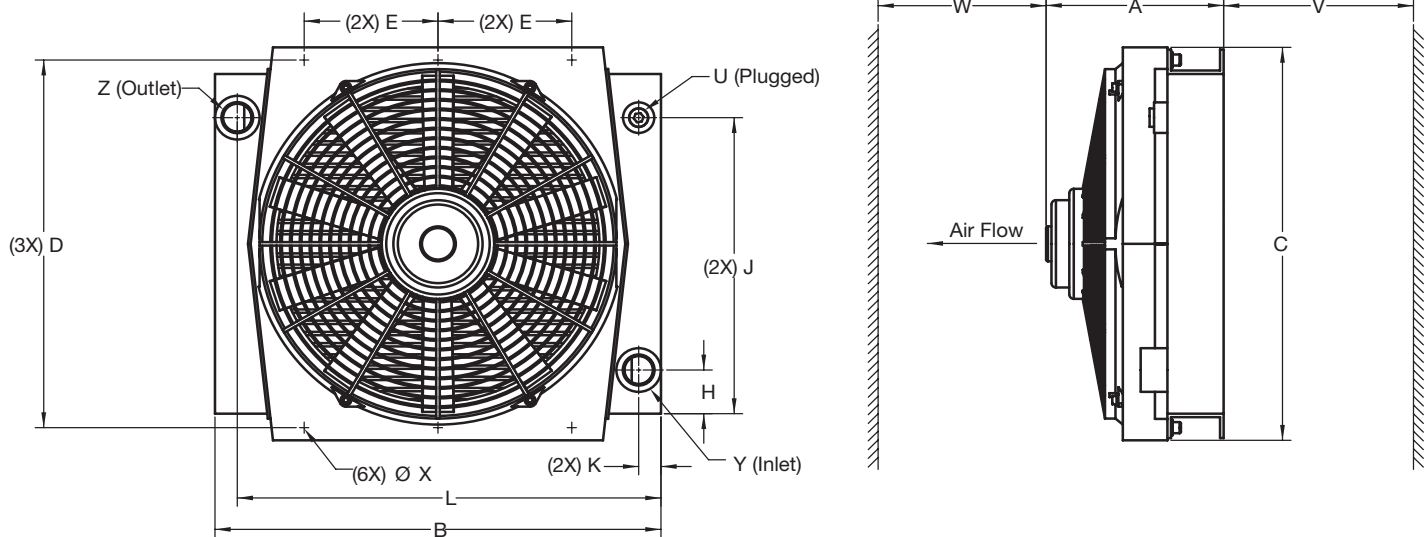
# ELD Series

Dimensions  
Size 1.5



A	B	C	D	E	F	H	J	K	L	V	W	U	X	Y	Z
5.35	12.99	9.84	9.06	4.53	2.56	1.32	6.24	0.98	12.01	3.94	7.87	1/2" NPT	0.35	1-1/16"-12 (F)	1-1/16"-12 (F)

Sizes 2 - 4

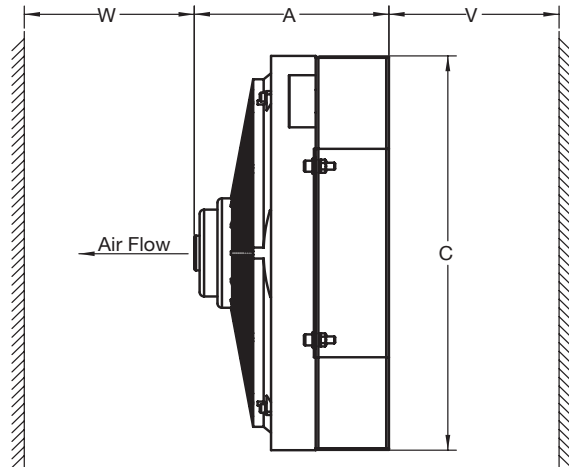
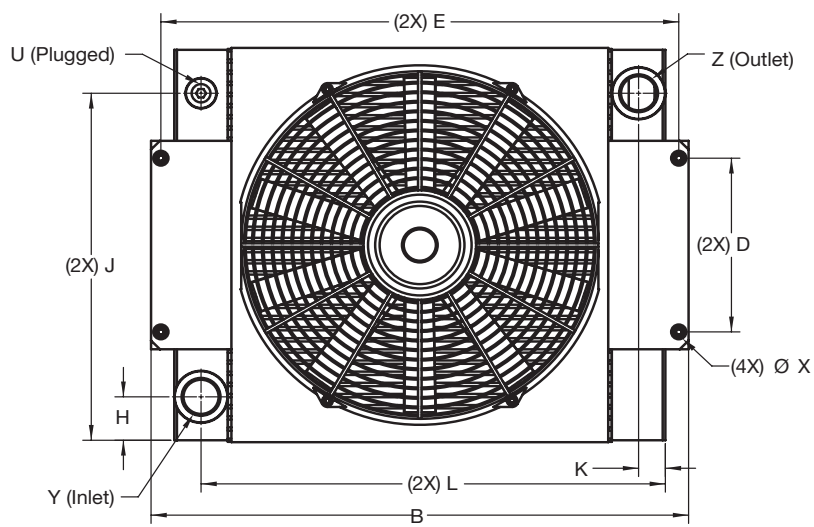


Size	A	B	C	D	E	H	J	K	L	V	W	U	X	Y	Z
ELD 2	8.15	15.12	12.32	11.34	3.15	1.18	9.02	1.18	13.94	5.91	9.84	1/2" NPT	Ø.39x0.55 slot	1-5/16"-12 (F)	1-5/16"-12 (F)
ELD 3	8.15	16.54	14.02	12.95	3.94	1.42	10.47	0.98	15.55	7.09	11.81	1/2" NPT	Ø.39x0.55 slot	1-5/16"-12 (F)	1-5/16"-12 (F)
ELD 4	7.83	19.69	17.72	16.57	5.91	1.97	13.35	0.98	18.70	7.87	15.75	1/2" NPT	Ø.41x0.5 slot	1-5/16"-12 (F)	1-5/16"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

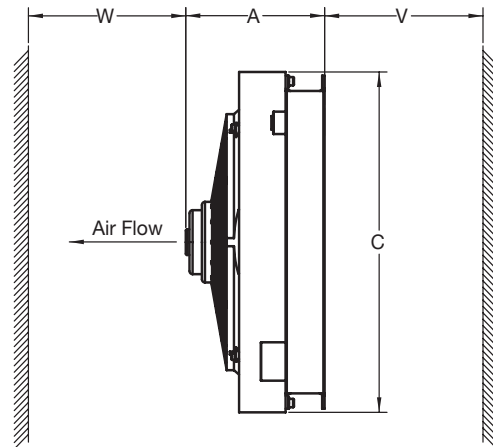
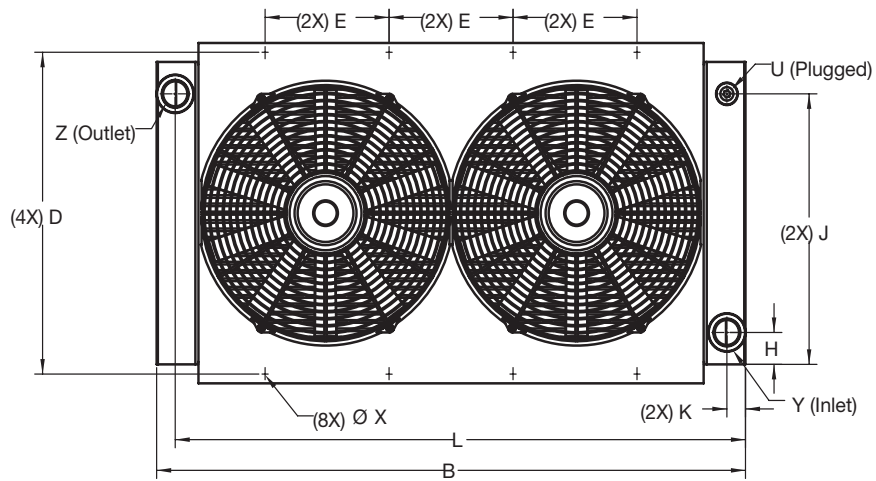
# ELD Series

Dimensions  
Sizes 4.5



A	B	C	D	E	H	J	K	L	V	W	U	X	Y	Z
8.58	23.70	17.87	7.87	22.83	1.97	15.73	1.18	20.47	7.87	15.75	1/2" NPT	0.47	1-5/8"-12 (F)	1-5/8"-12 (F)

Sizes 5 - 6



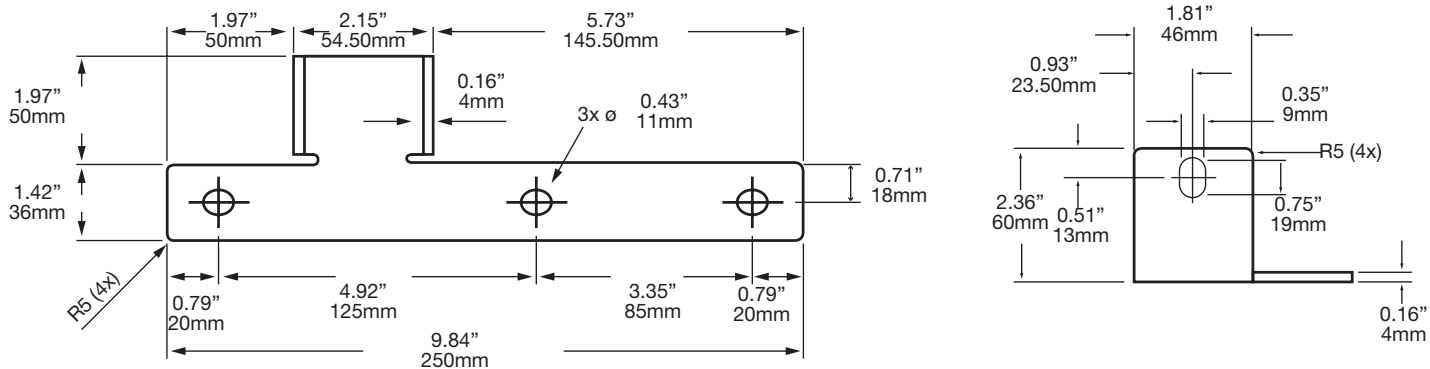
Size	A	B	C	D	E	H	J	K	L	V	W	U	X	Y	Z
ELD 5	9.13	31.89	18.90	17.72	6.69	1.95	14.59	1.18	30.73	7.87	15.75	1/2" NPT	Ø.39x0.55 slot	1-5/8"-12 (F)	1-5/8"-12 (F)
ELD 6	8.86	37.40	20.94	19.80	7.87	1.96	16.65	1.18	36.22	9.84	19.69	1/2" NPT	Ø.39x0.71 slot	1-5/8"-12 (F)	1-5/8"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# ELD Series - Mounting Foot Bracket

Dimensions

Sizes 2-4 / 5-6



Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches/mm.

# ELH Series - Hydraulic Fan Drive

Air Cooled Oil Coolers  
for Mobile Applications



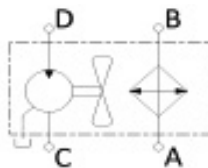
## Description

These coolers use a combination of high performance cooling elements combined with a high capacity hydraulic fan drive to give long, trouble free operation in mobile hydraulic applications. The compact design allows the coolers to fit most equipment and provides the highest cooling performance in heat dissipation while minimizing space required.

## Features

- ELH 2 - 5 coolers are designed with the inlet/outlet ports facing towards the back to help reduce fittings
- Available with internal pressure and temperature bypass
- All units feature a built in thermostat port
- Up to 180 HP cooling capacity
- Rated flows up to 90 gpm (consult factory for higher flows)
- Hydraulic motor drive offers more cooling in a smaller package
- Optional thermal speed control and pressure relief  
(Consult Factory)

## Hydraulic Symbol



## Applications



Agricultural



Offshore



Construction



Railways



Industrial



Utility



Material Handling



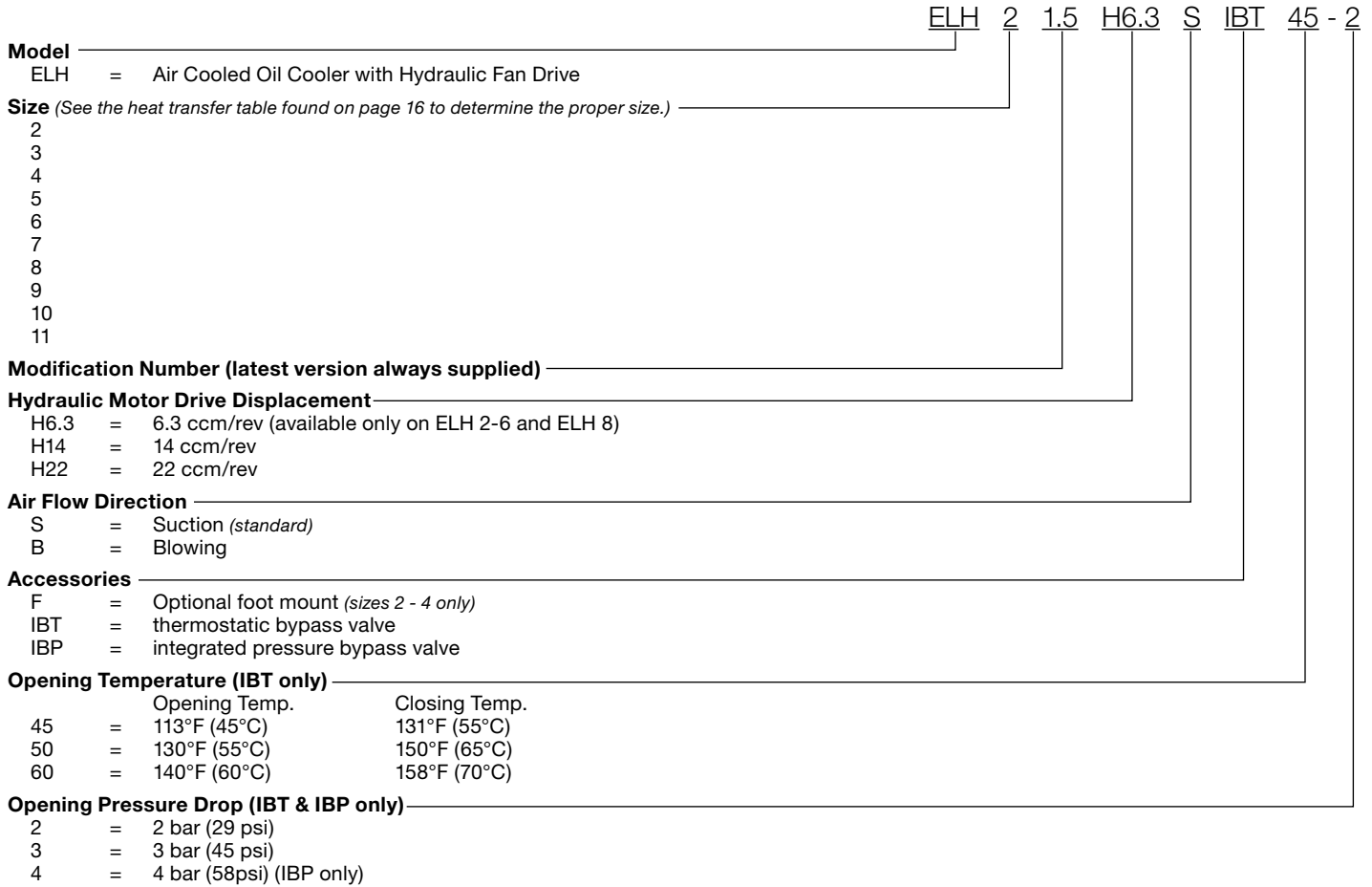
Forestry

## General

Construction	Housing	Welded Steel
	Heat Exchanger	Aluminum - Heavy Duty bar and plate
	Fan	Plastic
	Motor	Aluminum housing, Steel gears and shaft
Maximum Oil Temperature		266°F (130°C)
Maximum Operating Pressure		230 psi (16 bar)
Mounting Orientation		All positions
Fan Rotation		See arrow on housing
Filtration		ISO/DIS 4406 Code 19/16- Filtration grade B25>75
Maximum Outlet Side Pressure	Motor	1740 psi (120 bar)
Maximum Drain Pressure	Motor	29 psi (2 bar)
Fluid Viscosity Range	Motor	10 - 600 cst. (recommended 30 - 45 cst.)
Fluid Temperature Range	Motor	Up to 194° F (90°C)

For more information, please visit us at [www.hydacusa.com](http://www.hydacusa.com)

## Model Code



## Specifications

Size	Motor Displacement (cm <sup>3</sup> /rev)	Operating Speed Range (rpm)	Δp of Motor @ max RPM @ 34 cst (psi)	Motor Oil Flow @1500 RPM (gpm)	Continuous Motor Operating Pressure (psi)	Noise Level @1000 RPM (dBa @1 Meter)*	Weight (lbs.)
ELH 2	6.3 / 14 / 22	1000 / 3000	290	2.8 / 6 / 9.7	3625 / 3625 / 2175	69	25
ELH 3	6.3 / 14 / 22	1000 / 3000	290	2.8 / 6 / 9.7	3625 / 3625 / 2175	69	29
ELH 4	6.3 / 14 / 22	1000 / 3000	725 / 435 / 290	2.8 / 6 / 9.7	3625 / 3625 / 2175	70	40
ELH 5	6.3 / 14 / 22	1000 / 3000	1015 / 435 / 290	2.8 / 6 / 9.7	3625 / 3625 / 2175	70	53
ELH 6	6.3 / 14 / 22	1000 / 3000	2175 / 1015 / 725	2.8 / 6 / 9.7	3625 / 3625 / 2175	70	95
ELH 7	14 / 22	1000 / 2800	TBA	6 / 9.7	3625 / 2175	77	166
ELH 8	6.3 / 14 / 22	1000 / 2800	2900 / 1160 / 870	2.8 / 6 / 9.7	3625 / 3625 / 2175	76	148
ELH 9	14 / 22	1000 / 2200	1885 / 1305	6 / 9.7	3625 / 2175	78	188
ELH 10	14 / 22	1000 / 1800	3335 / 1885	6 / 9.7	3625 / 2175	82	243
ELH 11	14 / 22	1000 / 1600	3625 / 2175	6 / 9.7	3625 / 2175	83	342

\*The noise levels are only a guide as acoustic properties vary and depend on the characteristics of the room, connections, viscosity, and resonance.

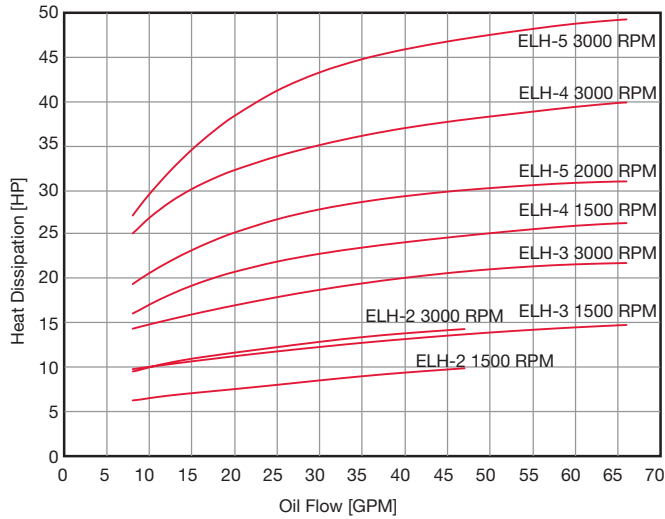
# ELH Series

## Heat Dissipation @ $\Delta T = 72^\circ F$

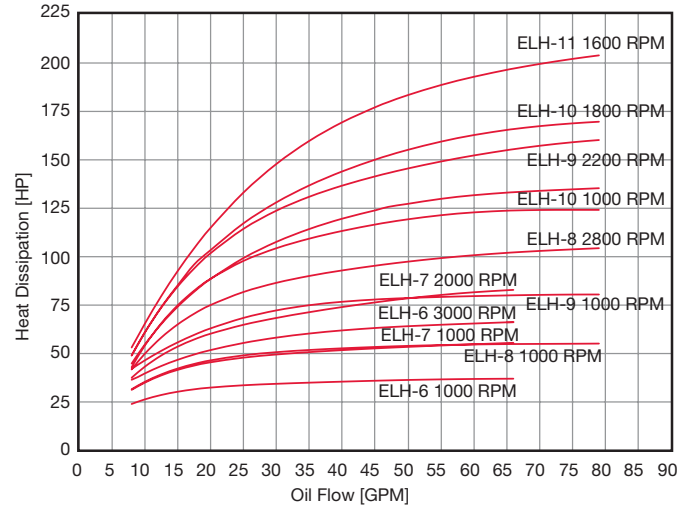
(tolerance  $\pm 5\%$ )

Cooling capacity depends on oil flow and the temperature differential ( $\Delta T$ ) between the oil inlet and air inlet.

### Sizes 2 - 5



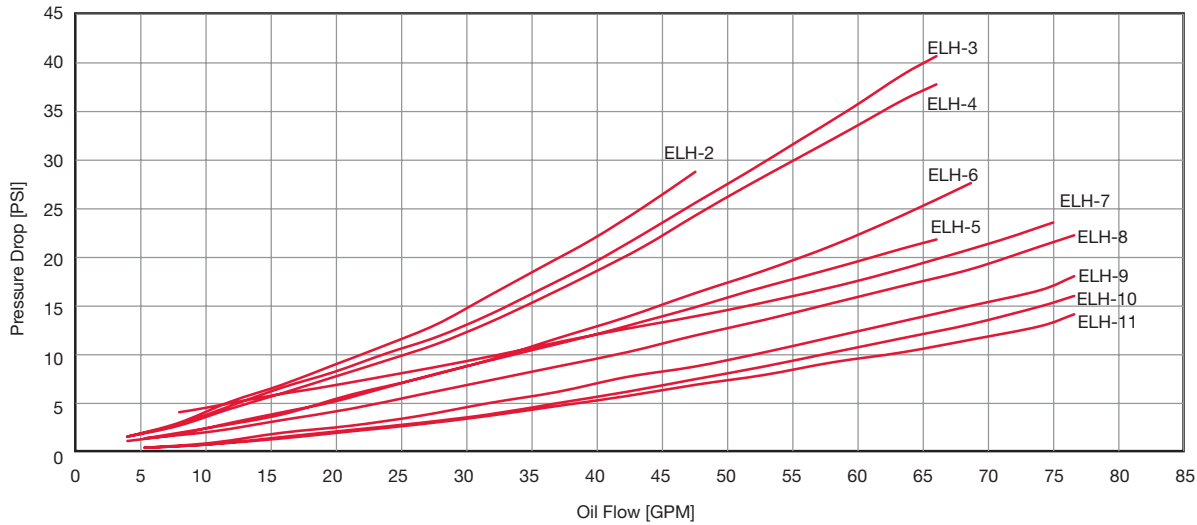
### Sizes 6 - 11



## Pressure Drop @ 30cSt

(tolerance  $\pm 5\%$ )

Pressure differential  $\Delta p$  depending on flow rate Q and the viscosity of the oil.



- For other viscosities, the result must be multiplied by the K factors below

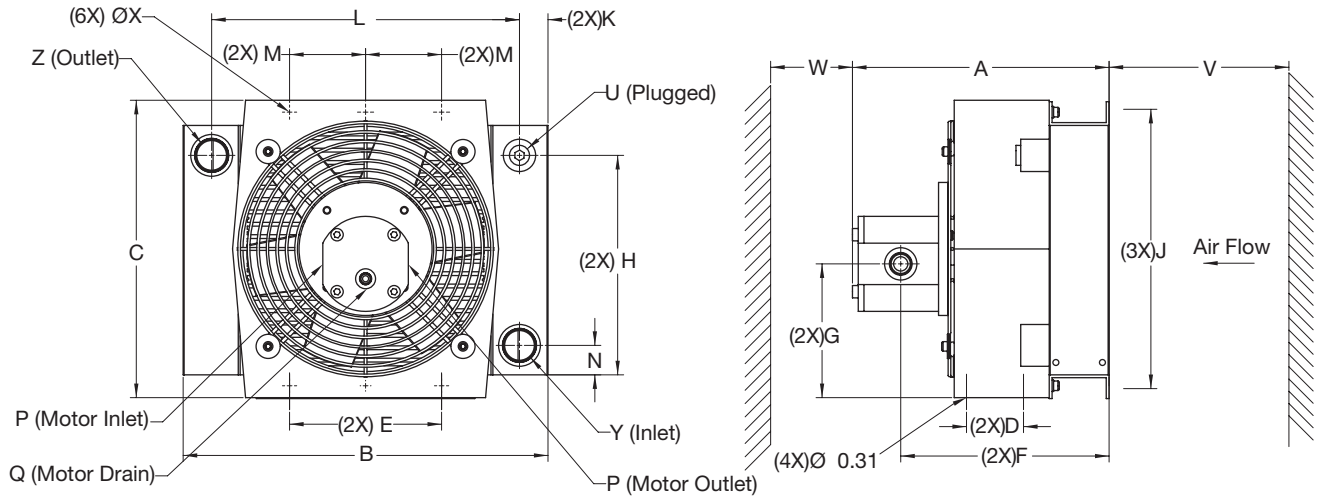
### K Factor Chart

Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3



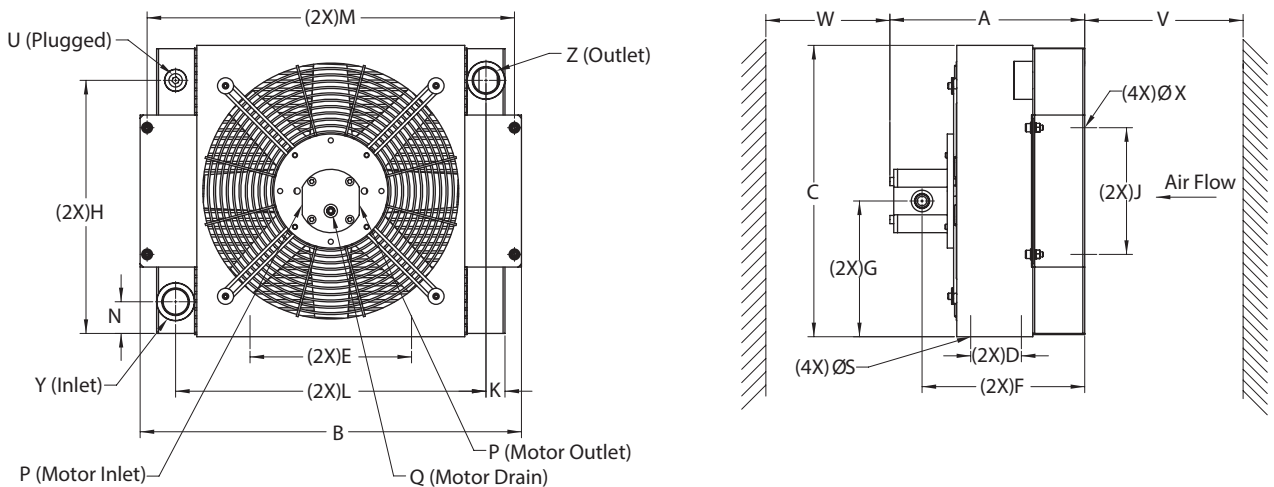
# ELH Series

Dimensions  
Sizes 2 - 4



Size	A6.3cc	A14cc	A22cc	B	C	D	E	F6.3cc	F14cc	F22cc	G	H	J
ELH 2	10.63	11.13	11.70	15.12	12.32	2.36	6.30	8.63	8.88	9.17	5.58	9.09	11.48
ELH 3	10.97	11.47	12.03	16.54	14.02	3.15	9.45	8.97	9.22	9.50	6.39	10.47	12.95
ELH 4	11.56	12.06	12.62	19.69	17.72	3.15	10.52	9.56	9.81	10.09	8.24	13.35	16.57
	K	L	M	N	P	Q	U	V	W	X	Y	Z	
ELH 2	1.18	12.76	3.15	1.32	7/8"-14	7/16"-20	1/2"NPT	5.91	7.87	0.39x0.59 slot	1-5/16"-12	1-5/16"-12	
ELH 3	0.98	14.57	3.94	1.42	7/8"-14	7/16"-20	1/2"NPT	7.09	9.84	0.39x0.59 slot	1-5/16"-12	1-5/16"-12	
ELH 4	0.98	17.72	5.91	1.97	7/8"-14	7/16"-20	1/2"NPT	7.87	13.78	0.39x0.59 slot	1-5/16"-12	1-5/16"-12	

## Size 5

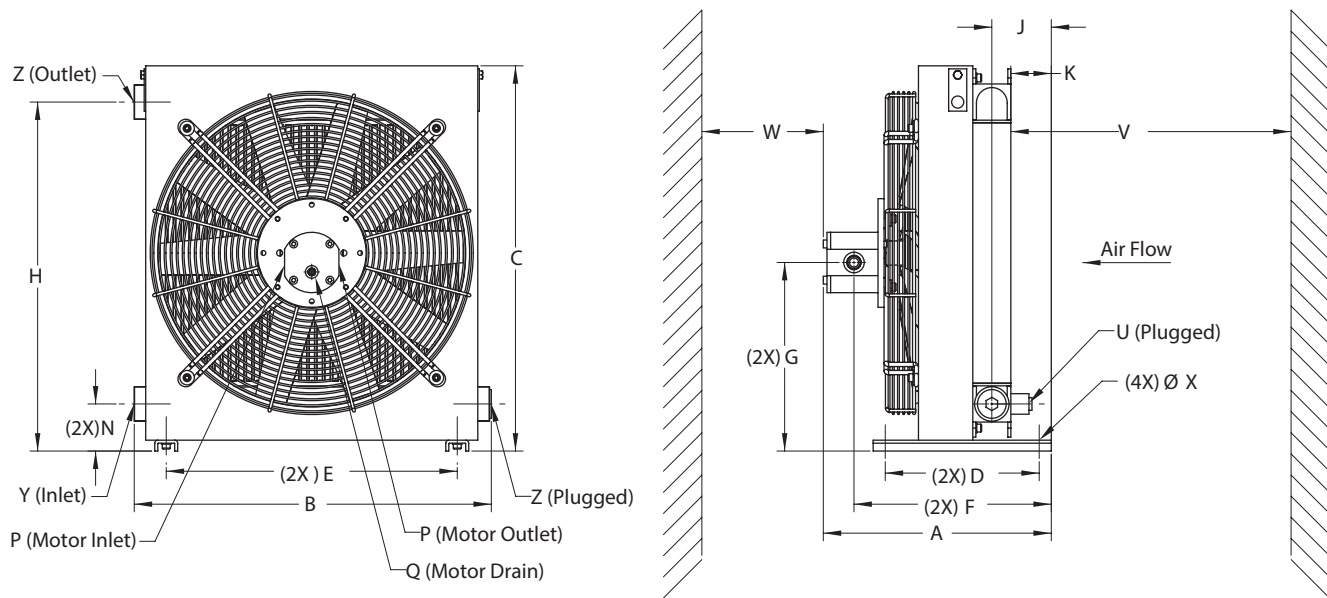


A6.3cc	A14cc	A22cc	B	C	D	E	F6.3cc	F14cc	F22cc	G	H	J
12.11	12.61	13.17	23.7	18.11	3.15	10.04	10.11	10.36	10.64	8.44	15.73	7.87
K	L	M	N	P	Q	S	U	V	W	X	Y	Z
1.19	19.29	22.83	1.97	7/8"-14	7/16"-20	0.31	1/2"NPT	9.84	15.75	0.47	1-5/8"-12	1-5/8"-12

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

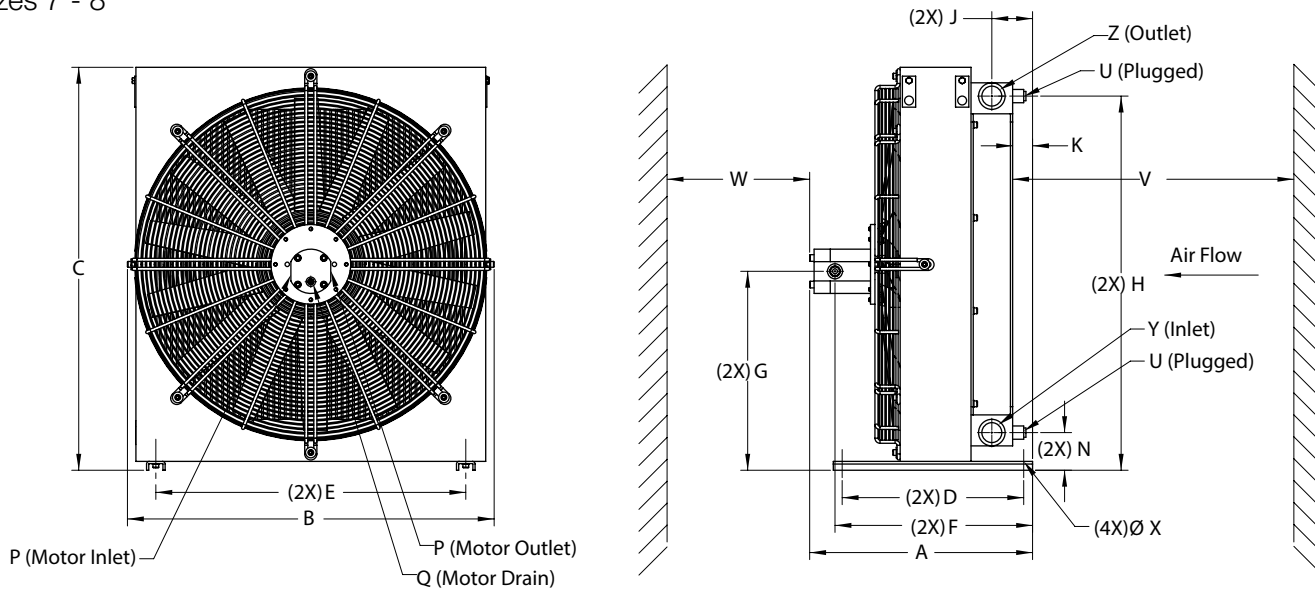
# ELH Series

Dimensions  
Sizes 6



A6.3cc	A14cc	A22cc	B	C	D	E	F6.3cc	F14cc	F22cc	G	H	J
14.87	15.37	15.93	23.17	25.12	10.04	18.98	12.87	13.12	13.4	12.3	22.76	3.88
K	N	P	Q	U	V	W	X		Y		Z	
2.64	3.08	7/8"-14	7/16"-20	1/2"NPT	23.62	39.37	0.35		1-5/8"-12		1-5/8"-12	

Sizes 7 - 8

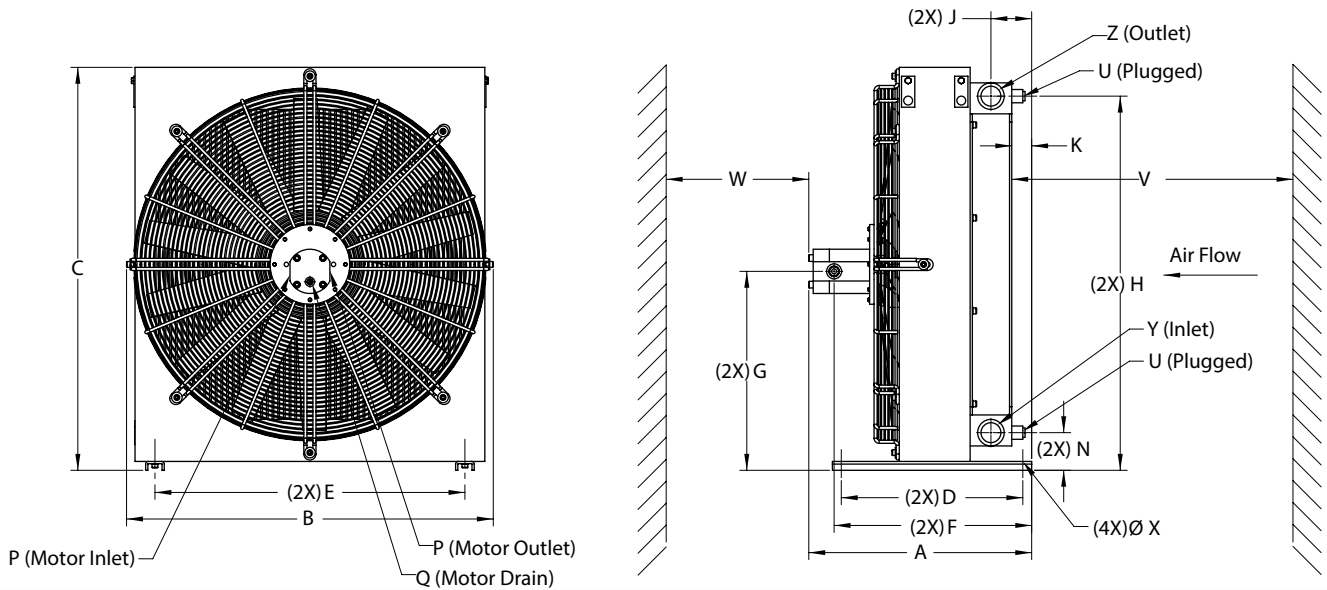


Size	A6.3cc	A14cc	A22cc	B	C	D	E	F6.3cc	F14cc	F22cc	G	H	J
ELH 7	-	17.72	18.06	27.8	28.58	16.14	22.05	-	15.24	15.52	14.07	26.5	2.89
ELH 8	15.07	15.57	16.13	27.24	30.08	10.04	18.98	13.06	13.31	13.59	14.78	27.76	3.7
	K	N	P	Q	U	V	W	X		Y		Z	
ELH 7	1.65	2.87	7/8"-14	7/16"-20	1/2"NPT	25	42	0.35x0.78 slot		1-5/8"-12		1-5/8"-12	
ELH 8	2.09	3.03	7/8"-14	7/16"-20	1/2"NPT	27.56	43.31	0.35		1-5/8"-12		1-5/8"-12	

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# ELH Series

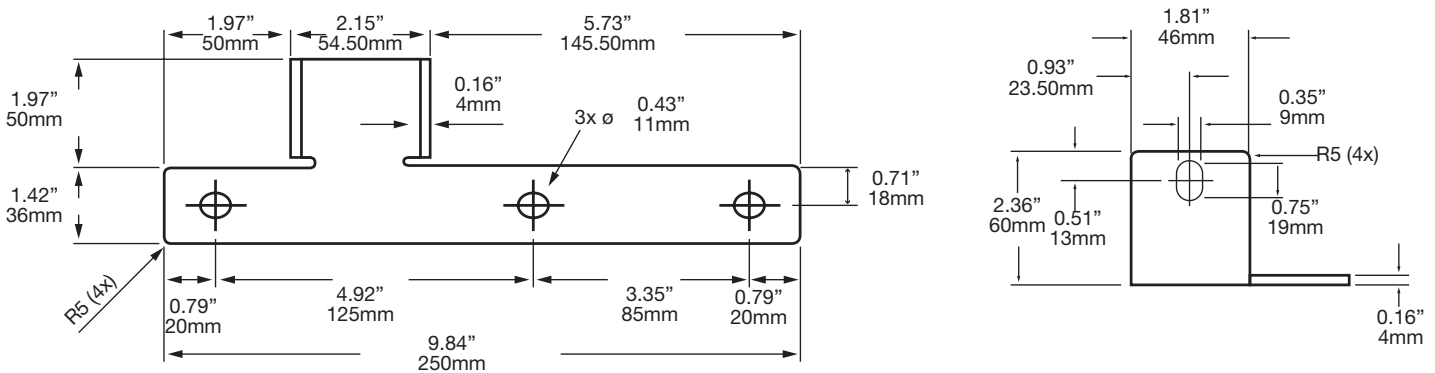
Dimensions  
Sizes 9 - 11



Size	A14cc	A22cc	B	C	D	E	F14cc	F22cc	G	H
ELH9	19.82	20.38	32.61	35.83	16.14	27.56	17.57	17.85	17.69	33.27
ELH10	20.65	21.21	38.23	41.73	18.11	27.56	18.39	18.67	20.84	39.37
ELH11	21.43	21.99	42.91	46.46	18.11	27.56	19.18	19.46	23.2	44.69
	J	K	N	P	Q	U	V	W	X	Z
ELH9	3.62	1.77	3.35	7/8"-14	7/16"-20	1/2"NPT	35.43	47.24	0.35x0.78 slot	1-7/8"-12
ELH10	3.66	1.81	3.54	7/8"-14	7/16"-20	1/2"NPT	35.43	55.12	0.35	1-7/8"-12
ELH11	3.66	1.81	2.95	7/8"-14	7/16"-20	1/2"NPT	39.37	62.99	0.35	1-7/8"-12

## ELH Series 2-4 Mounting Foot Bracket

Dimensions



Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches/mm.

# OKC Series - AC Motor Drive

Air Cooled Oil Coolers



## Description

These coolers use a combination of high performance cooling elements and high capacity, compact AC electric powered fans to give long trouble free operation in hydraulic applications.

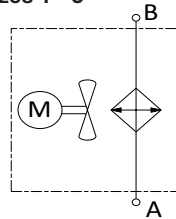
The compact design allows the coolers to fit most equipment and provide the highest cooling performance in heat dissipation while minimizing space required.

## Features

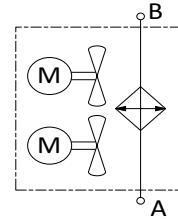
- Cooling Range: up to 23 HP
- AC Motors in 115/230/460 Volt 50/60 Hz
- Electrical connection box is included
- Coolers are designed with the inlet/outlet ports facing towards the back to help reduce fittings.
- Available with internal pressure or thermal bypass
- All coolers feature a built in thermostat port.

## Hydraulic Symbol

Sizes 1 - 5



Sizes 6 - 7



## Applications



Gearboxes



Industrial

## General

<b>Construction</b>	<b>Housing</b>	Welded Steel
	<b>Heat Exchanger</b>	Aluminum Heavy Duty Bar and Plate
	<b>Fan</b>	Steel
<b>Mounting Orientation</b>		Any Orientation
<b>Maximum Pressure</b>		230 psi (16 Bar)
<b>Fluids</b>		Mineral oil to DIN 51524 Part 1 and 2
<b>Ambient Temperature</b>		50° – 104°F (10° – 40°C)
<b>Maximum Oil Temperature</b>		266°F (130°C)
<b>Standard Airflow Direction</b>		Air pulled across heat exchanger
<b>Filtration</b>		ISO/DIS 4406 Code 19/16- Filtration Grade B25>75
<b>Environmental Protection Class</b>		IP55

For more information, please visit us at [www.hydacusa.com](http://www.hydacusa.com)

## Model Code

**OKC 1H 1.5 230 / S / TS140 X X**

**Model** \_\_\_\_\_  
 OKC = Air Cooled Oil Cooler with AC motor drive

**Size** \_\_\_\_\_  
 1H  
 2H  
 3H  
 4S  
 5S  
 6H  
 7S

H = High Speed Fan  
 S = Standard Speed Fan

**Modification Number** (latest version always supplied) \_\_\_\_\_

**Electric Motor Fan Voltage** \_\_\_\_\_  
 115 = 115 Volts 50/60 Hz 1PH (consult factory)  
 230 = 230 Volts 50/60 Hz 1PH  
 460 = 460 Volts 50/60 Hz 3PH

**Air Flow Direction** \_\_\_\_\_  
 S = Suction

**Accessories** \_\_\_\_\_  
 (omit) = None  
 TS-120 = Inline Thermostat, Fixed 120°F  
 TS-140 = Inline Thermostat, Fixed 140°F  
 TS-160 = Inline Thermostat, Fixed 160°F  
 F = Optional Foot Mount  
 IBT = Thermostatic bypass valve  
 IBP = Integrated pressure bypass valve

**Opening Temperature (IBT only)** \_\_\_\_\_

	Opening Temp.	Closing Temp.
45	= 113°F (45°C)	131°F (55°C)
50	= 130°F (55°C)	150°F (65°C)
60	= 140°F (60°C)	158°F (70°C)

**Opening Pressure Drop (IBT & IBP only)** \_\_\_\_\_

2	= 2 bar (29 psi)
3	= 3 bar (45 psi)
4	= 4 bar (58psi) (IBP only)

## Specifications

Size	Current Draw (Amps)			Fan Diameter (mm) / (in)	Noise Level dBa* (1 Meter)	Weight (lbs.)
	115V / 230V / 460V	Speed @ 60Hz (rpm)	115V / 230V / 460V			
OKC 1H	1.1 / 0.54 / 0.34	3000 / 3000 / 2990	230 / 9.1	71	20	
OKC 2H	1.1 / 0.5 / 0.37	3000 / 3100 / 2900	230 / 9.1 (115V)	71	27	
			250 / 9.8 (230/460V)			
OKC 3H	1.55 / 0.75 / 0.56	2900 / 2640 / 2320	300 / 11.8	75	32	
OKC 4S	2.2 / 0.92 / 0.4	1650 / 1600 / 1600	400 / 15.8	69	47	
OKC 5S	1.1 / 0.92 / 0.4	1650 / 1600 / 1600	400 / 15.8	72	62	
OKC 6H	1.1 / 0.75 / 0.56	2900 / 2640 / 2320	300 / 11.8	75	86	
OKC 7S	2.2 / 0.92 / 0.4	1650 / 1600 / 1600	400 / 15.8	71	99	

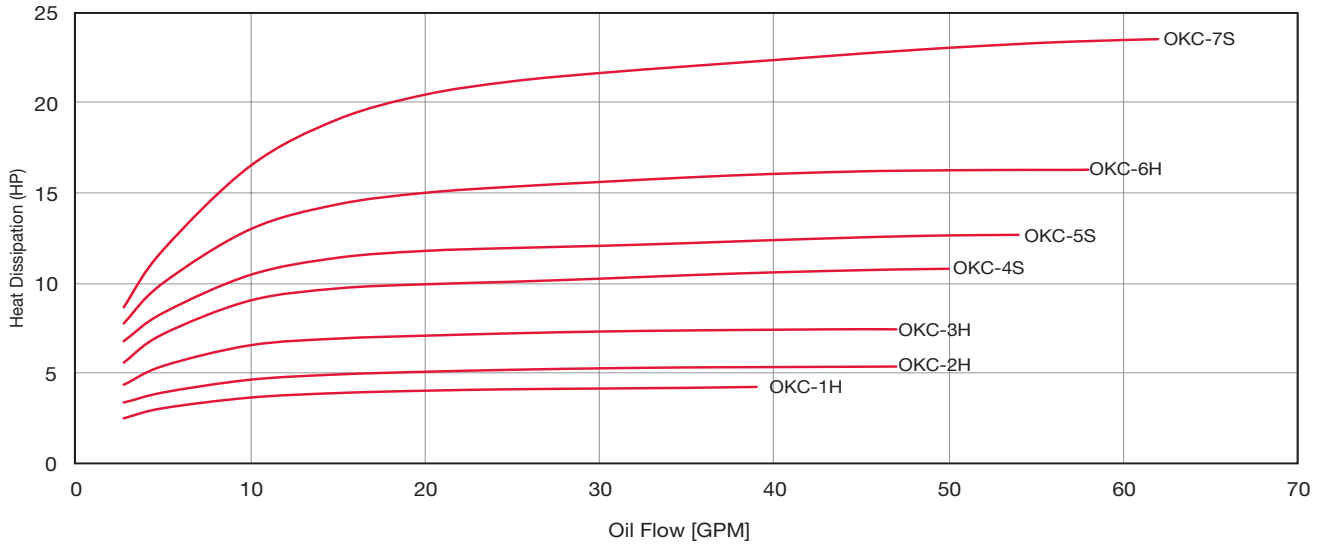
\* The noise levels are only a guide as acoustic properties depend on the characteristics of the room, connections, viscosity and resonance.

# OKC Series

## Heat Dissipation @ $\Delta T = 40^{\circ}F$

(tolerance  $\pm 5\%$ )

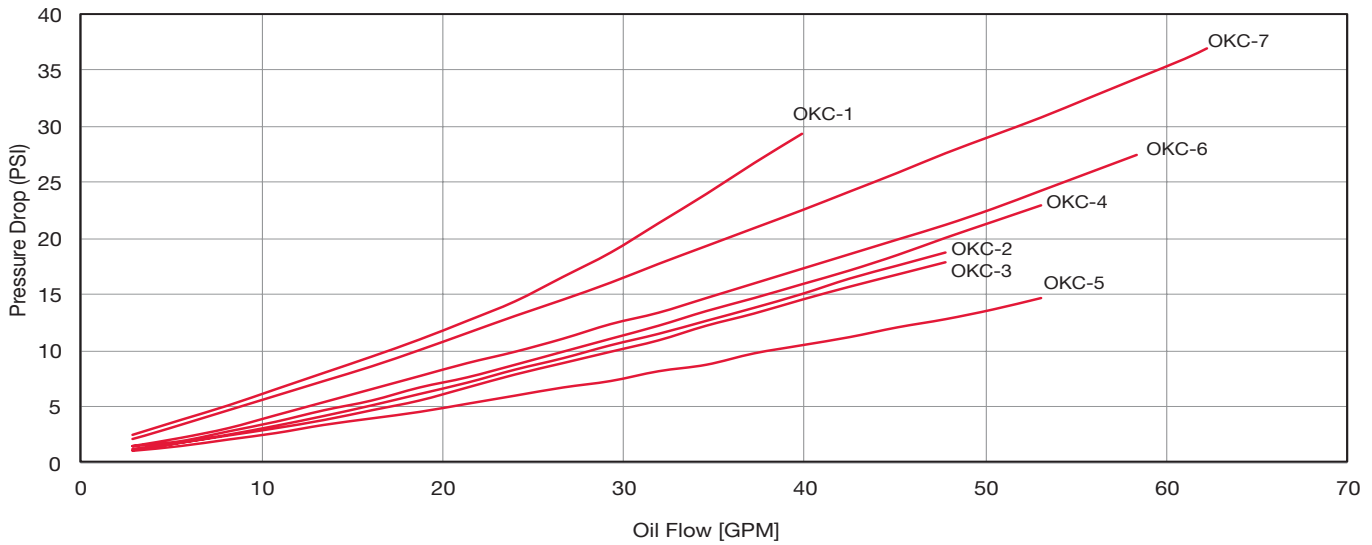
Cooling capacity depends on oil flow and the temperature differential ( $\Delta T$ ) between the oil inlet and air inlet.



## Pressure Drop @ 30cSt

(tolerance  $\pm 5\%$ )

Pressure differential  $\Delta p$  depending on flow rate  $Q$  and the viscosity of the oil.



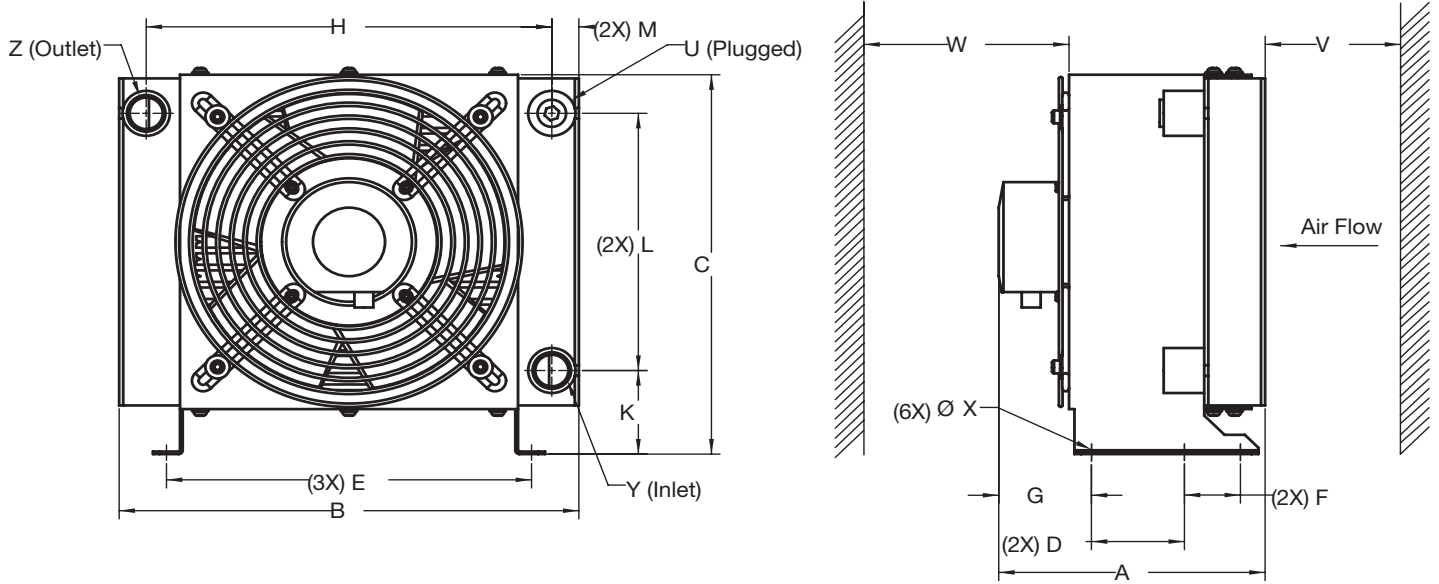
- For other viscosities, the result must be multiplied by the K factors below

### K Factor Chart

Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3

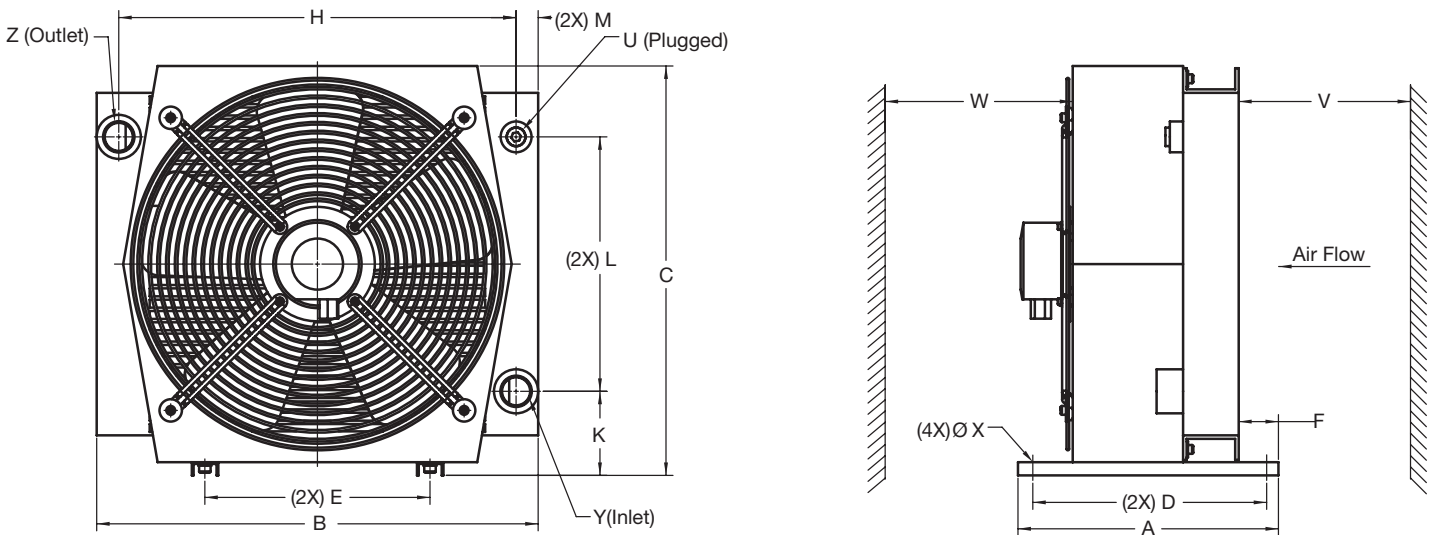
# OKC Series

Dimensions  
Sizes 1



A	B	C	D	E	F	G	H	K	L	M	V	W	U	X	Y	Z
7.76	13.39	11.61	1.97	10.63	2.36	2.64	11.81	2.56	7.87	0.79	2.76	7.87	1/2" NPT (F)	0.33	1 1/16" -12 (F)	1 1/16" -12 (F)

Sizes 2 - 4



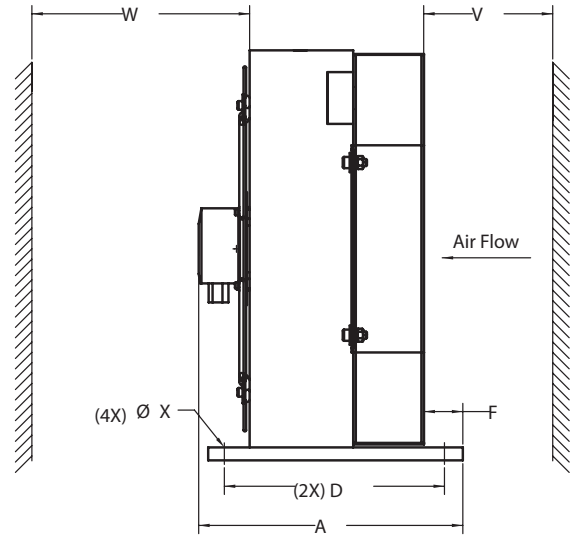
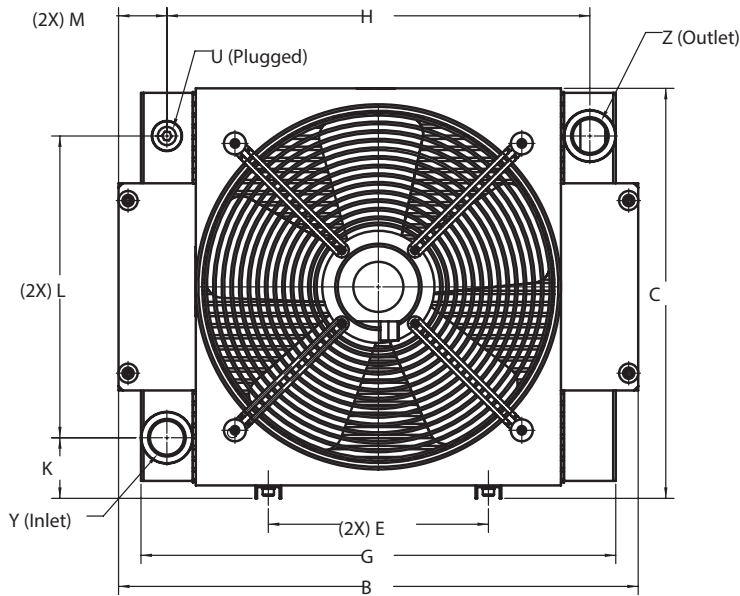
Size	A	B	C	D	E	F	H	K	L	M	V	W	U	X	Y	Z
2	11.61	15.12	12.91	10.04	6.3	2.95	12.76	2.76	7.87	1.18	5.91	9.84	1/2" NPT (F)	0.35	1-5/16"-12 (F)	1-5/16"-12 (F)
3	11.61	16.54	14.61	10.04	9.54	2.17	14.57	3.09	9.06	0.98	7.09	11.81	1/2" NPT (F)	0.35	1-5/16"-12 (F)	1-5/16"-12 (F)
4	11.61	19.69	18.31	10.04	10.04	1.77	17.72	3.76	11.39	0.98	7.87	15.75	1/2" NPT (F)	0.35	1-5/16"-12 (F)	1-5/16"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.  
Dimensions are in inches.

# OKC Series

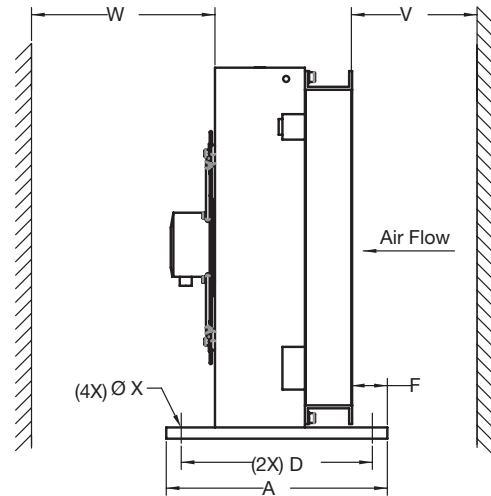
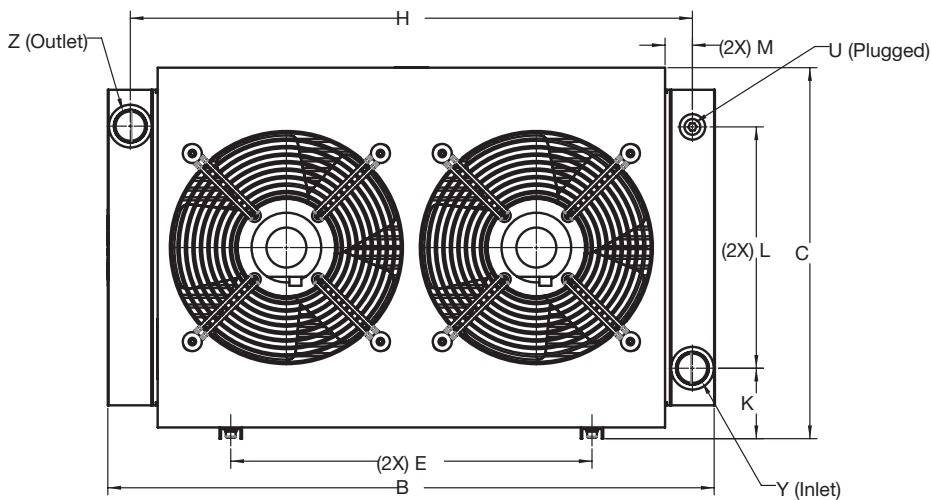
Dimensions

Sizes 5



A	B	C	D	E	G	H	K	L	M	U	X	Y	Z
12.05	23.7	18.7	10.04	10.04	21.65	19.3	2.76	13.76	2.2	1/2 NPT (F)	0.35	1 5/8" -12 (F)	1 5/8" -12 (F)

Sizes 6 - 7



Size	A	B	C	D	E	F	H	K	L	M	V	W	U	X	Y	Z
6	11.61	31.89	19.49	10.04	18.98	1.85	29.53	3.7	12.68	1.18	7.78	15.75	1/2" NPT (F)	0.35	1 5/8" -12 (F)	1 5/8" -12 (F)
7	11.61	37.4	21.54	10.04	18.98	1.85	35.04	3.72	14.69	1.18	9.84	19.8	1/2" NPT (F)	0.35	1 5/8" -12 (F)	1 5/8" -12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.





# OK Series - AC Motor Drive

Air Cooled Oil Coolers



## Description

The OK Series cooler design uses an axial fan assembly which draws air through the cooler. This offers excellent cooling capacity.

## Features

- Highly efficient bar and plate style heat exchangers
- Externally mounted heat exchangers for easy maintenance and cleaning
- Modular pump and filter options for a plug and play fluid conditioning system
- Available with HYDAC MF, LPF, and FLND series filters
- Accessories Include: Thermostats (*adjustable and fixed*), Integrated thermostatic bypass valves, and pressure bypass valves
- Up to 50 HP cooling capacity
- Packaged systems with pump flows ranging from 8.45 gpm to 61.8 gpm
- Maximum flows (w/o pump) up to 61.8 gpm

## Applications



Gearboxes



Industrial



Elevators



Power Generation



Pulp & Paper



Railways



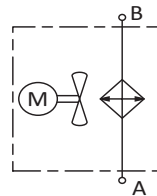
Shipbuilding



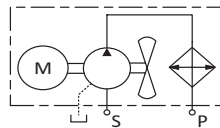
Steel / Heavy Industry

## Hydraulic Symbol

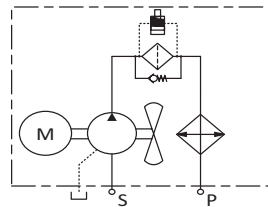
OK 2 - 7



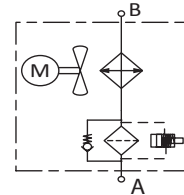
OKA 4 - 6



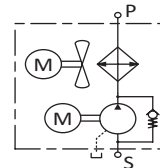
OKAF 4 - 6



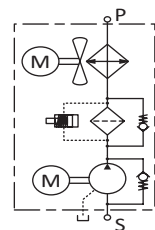
OKF 3 - 7



OKA 7



OKAF 7



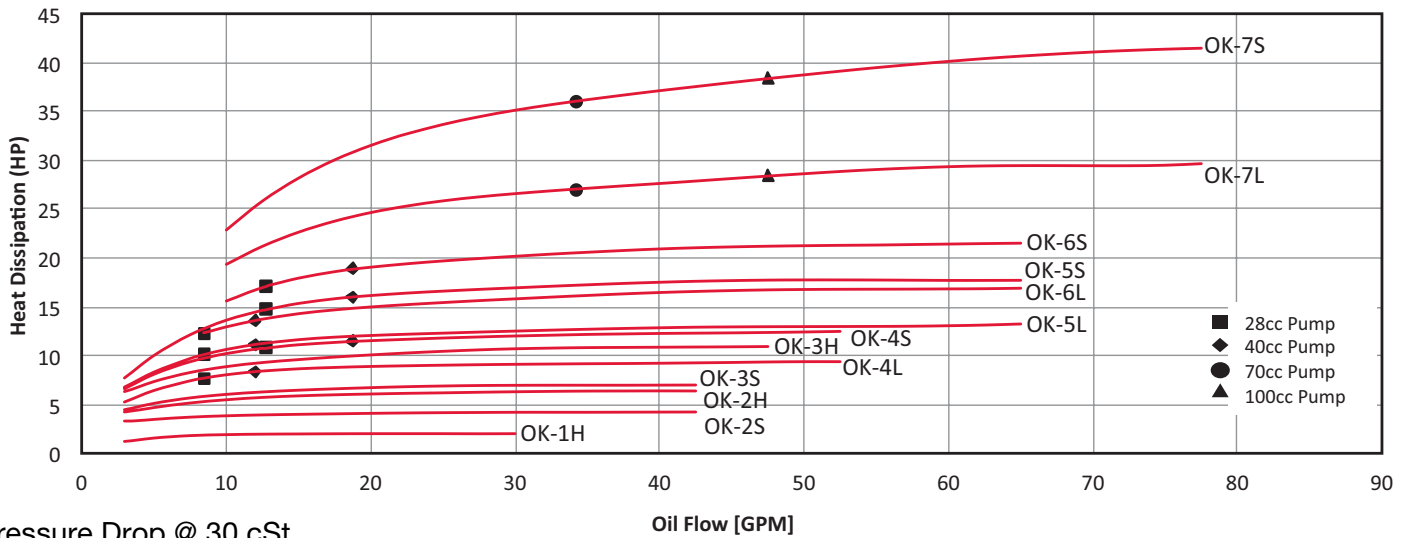


# OK Series

Heat Dissipation @  $\Delta T=40^{\circ}\text{F}$

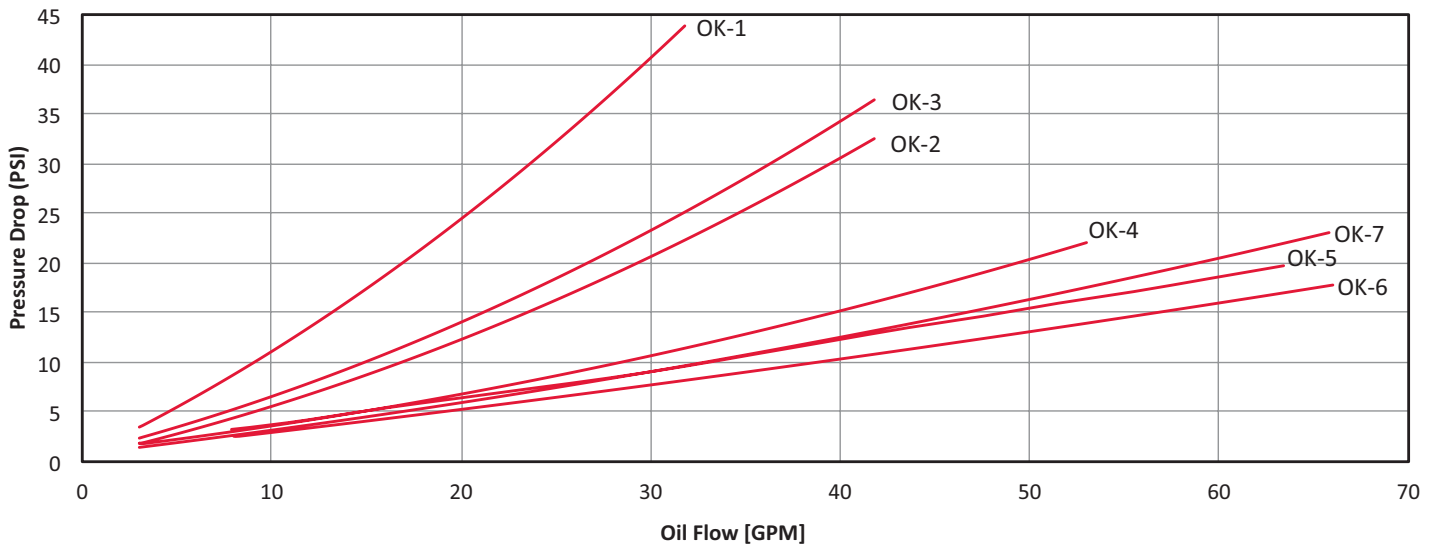
(tolerance  $\pm 5\%$ )

Cooling capacity depending on oil flow and the temperature differential  $\Delta T$  between the oil inlet and air temperature.



Pressure Drop @ 30 cSt

(tolerance  $\pm 5\%$ )



\*For other viscosities, the result must be multiplied by the K factors on the following page.

## General

<b>Construction</b>	<b>Housing</b>	Welded Steel
	<b>Heat Exchanger</b>	Aluminum Heavy Duty Bar and Plate
	<b>Fan</b>	Plastic
	<b>Motor</b>	TEFC, NEMA or IEC frame (varies by cooler size)
	<b>Pump</b>	Screw
<b>Mounting Orientation</b>		Horizontal, motor shaft
<b>Maximum Pressure</b>		230 psi (16 Bar)
<b>Fluids</b>		Mineral oil to DIN 51524 Part 1 and 2
<b>Ambient Temperature</b>		50° – 104°F (10° – 40°C)
<b>Maximum Oil Viscosity</b>	w/o pump	2000 cSt
	w/ pump	180 cSt
<b>Maximum Oil Temperature</b>	w/o pump	266°F (130°C)
	w/ pump	176°F (80°C)
<b>Standard Air Flow Direction</b>		Air pulled across heat exchanger
<b>Filtration</b>		ISO/DIS 4406 Code 19/16- Filtration Grade B25>75

\*Note: Sizes OKA-4-6 do not include relief valve. Pressures higher than 90 psi (measured at pump outlet) will result in motor overload conditions  
Size OKA-7 comes with a 145 psi relief valve built into the pump.

## K Factor Chart

Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3

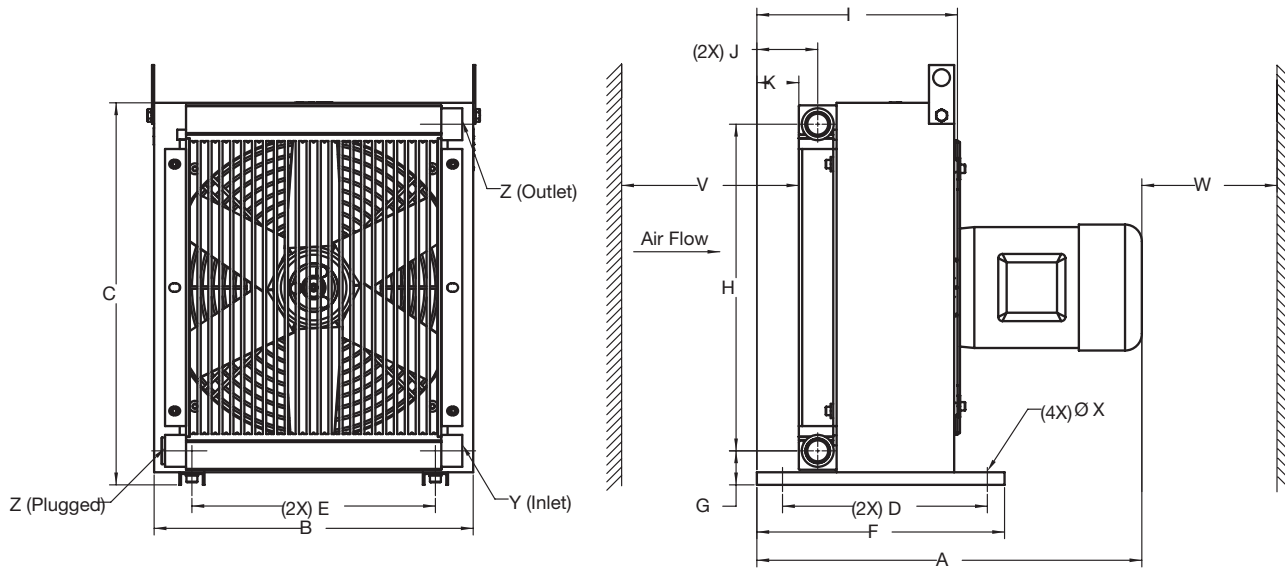
## Specifications

Model	Set up	Maximum Oil Flow Rate (gpm)	Pump Displacement - Flow Rate		Noise (dBa @ 1 meter)	Motor Spec Fan (HP)	Motor Spec Pump (HP)	Motor Spec Fan/Pump (rpm)
OK 2S	Fan	40	N/A		64	0.21 (kW)	N/A	1800
OK 2H	Fan	40			80	0.29 (kW)		3600
OK 3S, OKF 3S	Fan	40			66	0.21 (kW)		1800
OK 3H, OKF 3H	Fan	40			85	0.63 (kW)		3600
OK 4L, OKF 4L	Fan	40			63	0.33		1200
OKA 4L, OKAF 4L	Fan w/ pump	N/A	28 cc/rev 8.45 gpm	40 cc/rev 12 gpm	68	N/A	2	1200
OK 4S, OKF 4S	Fan	40	N/A		72	0.5	N/A	1800
OKA 4S, OKAF 4S	Fan w/ pump	N/A	28 cc/rev 12.75 gpm	40 cc/rev 18.5 gpm	75	N/A	3	1800
OK 5L, OKF 5L	Fan	60	N/A		72	0.33	N/A	1200
OKA 5L, OKAF 5L	Fan w/ pump	N/A	28 cc/rev 8.45 gpm	40 cc/rev 12 gpm	75	N/A	2	1200
OK 5S, OKF 5S	Fan	60	N/A		79	1.5	N/A	1800
OKA 5S, OKAF 5S	Fan w/ pump	N/A	28 cc/rev 12.75 gpm	40 cc/rev 18.5 gpm	81	N/A	3	1800
OK 6L, OKF 6L	Fan	60	N/A		72	0.75	N/A	1200
OKA 6L, OKAF 6L	Fan w/ pump	N/A	28 cc/rev 8.45 gpm	40 cc/rev 12 gpm	77	N/A	2	1200
OK 6S, OKF 6S	Fan	60	N/A		79	1.5	N/A	1800
OKA 6S, OKAF 6S	Fan w/ pump	N/A	28 cc/rev 12.75 gpm	40 cc/rev 18.5 gpm	82	N/A	3	1800
OK 7L, OKF 7L	Fan	74	N/A		80	2	N/A	1200
OKA 7L, OKAF 7L	Fan w/ pump	N/A	70 cc/rev 34.3 gpm	100 cc/rev 47.5 gpm	84	2	5 (70cc/rev) 7.5 (100 cc/rev)	1200 / 1800
OK 7S, OKF 7S	Fan	74	N/A		85	5	N/A	1800
OKA 7S, OKAF 7S	Fan w/ pump	N/A	70 cc/rev 34.3 gpm	100 cc/rev 47.5 gpm	87	5	5 (70cc/rev) 7.5 (100 cc/rev)	1800 / 1800

# OK Series

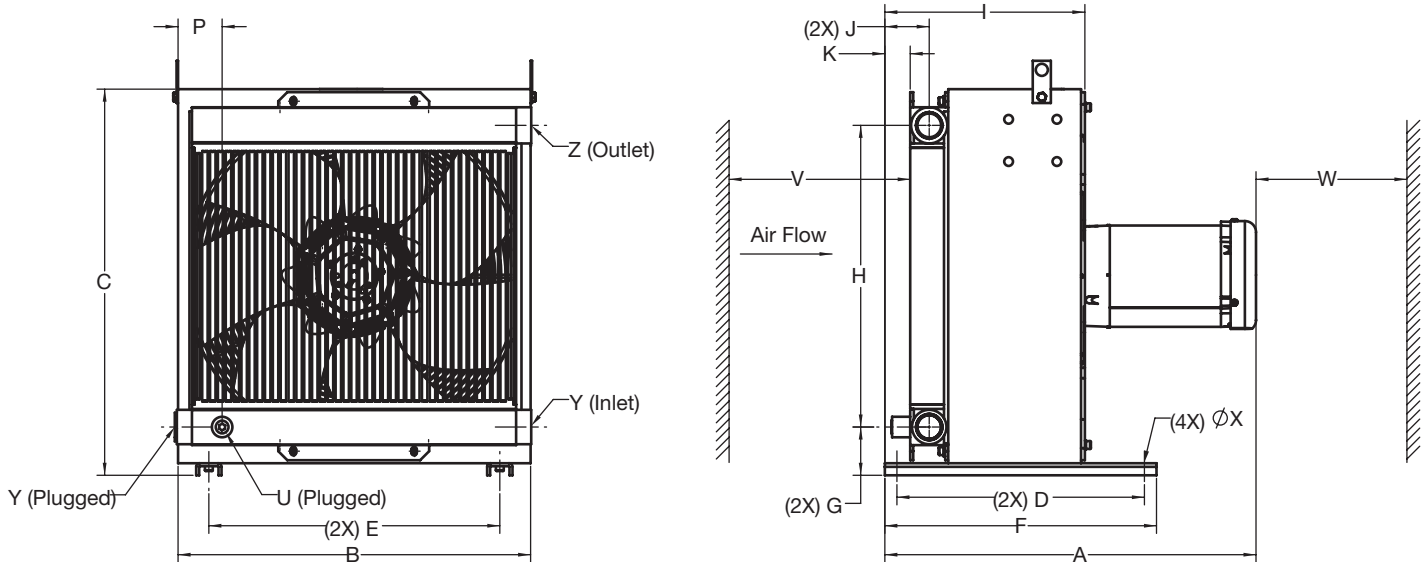
Dimensions

Size 2 - 3



Size	A	B	C	D	E	F	G	H	I	J	K	V	W	X	Y	Z
OK2H,S	17.46	12.99	13.98	10.04	6.3	11.61	1.59	11.38	7.87	2.26	1.38	7.87	19.69	0.35	1 1/16"-12 (F)	1 1/16"-12 (F)
OK3H,S	17.46	14.96	17.91	10.04	11.42	11.61	1.59	15.31	8.66	2.26	1.38	11.81	31.5	0.35	1 1/16"-12 (F)	1 1/16"-12 (F)

Sizes 4 - 6



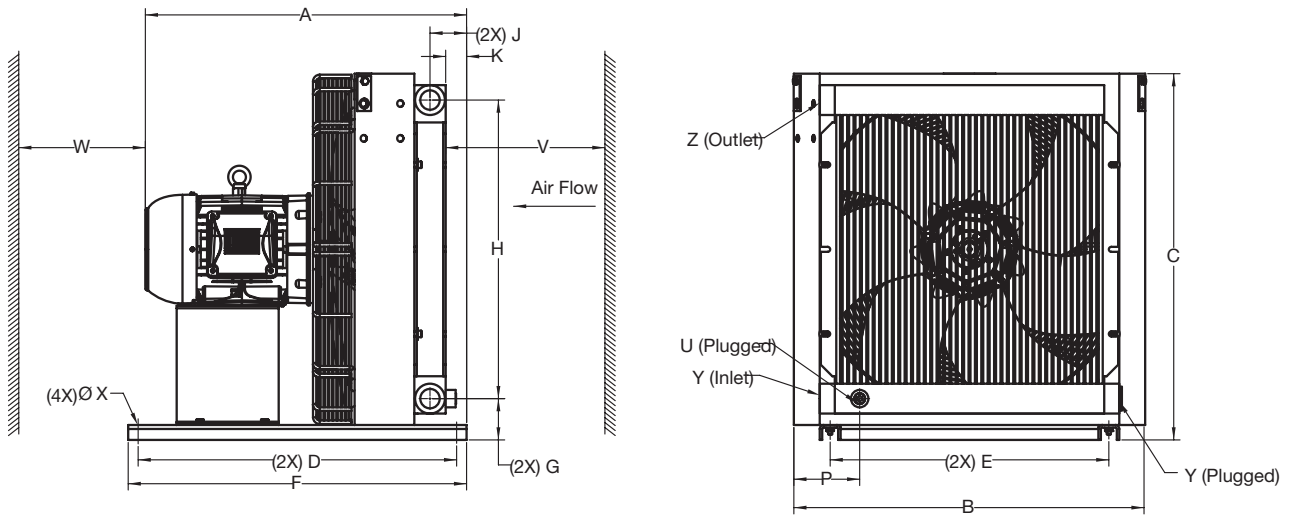
Size	A	B	C	D	E	F	G	H	I	J	K	P	U	V	W	X	Y	Z
OK4L,S	23.15	19.09	20.47	16.14	16.73	17.72	2.13	17.28	11.86	4.07	2.83	-	-	15.75	47.24	Ø.35x.78 slot	1-5/16"-12 (F)	1-5/16"-12 (F)
OK5L,S	23.55	21.34	22.13	16.14	18.98	17.72	2.81	17.28	12.26	3.68	2.44	-	-	19.69	59.06	Ø.35x.78 slot	1-5/16"-12 (F)	1-5/16"-12 (F)
OK6L,S	24.34	22.99	25.20	16.14	18.98	17.72	3.15	19.69	13.05	2.89	1.65	2.89	1/2" NPT	23.62	70.87	Ø.35x.78 slot	1-5/8"-12 (F)	1-5/8"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# OK Series

Dimensions

Size 7

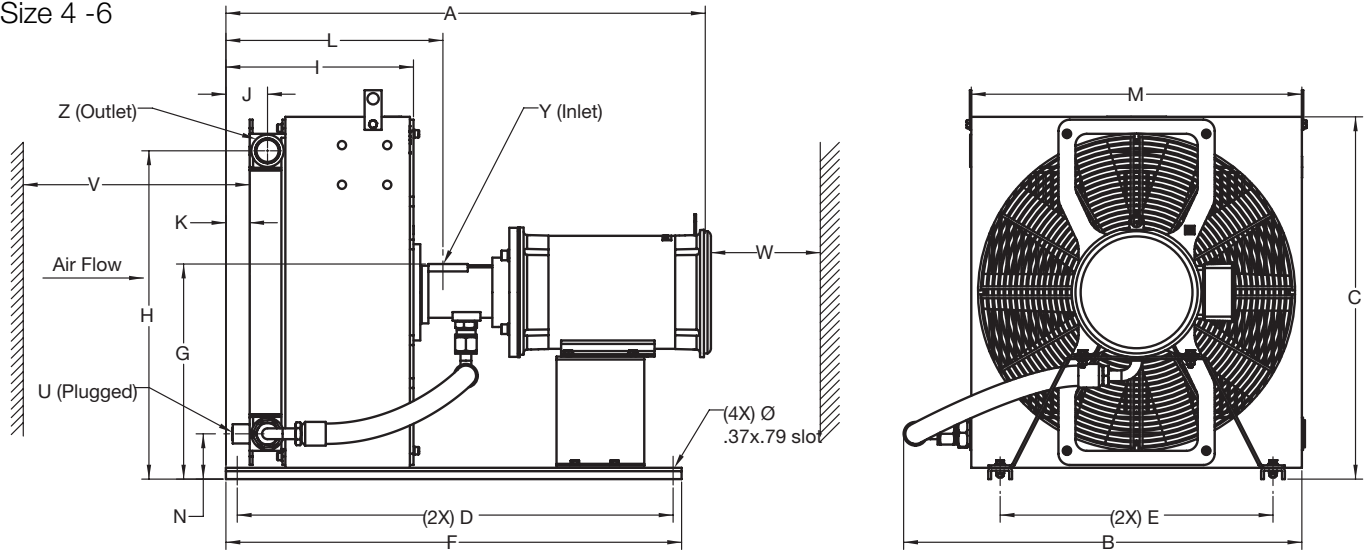


A	B	C	D	E	F	G	H	J	K	P	U	V	W	X	Y	Z
25.70	27.80	28.98	25.20	22.05	26.77	3.27	23.62	2.89	1.65	5.21	1/2" NPT	23.62	47.24	Ø.35x.78 Slot	1-5/8"-12 (F)	1-5/8"-12 (F)

# OKA Series

Dimensions

Size 4 -6



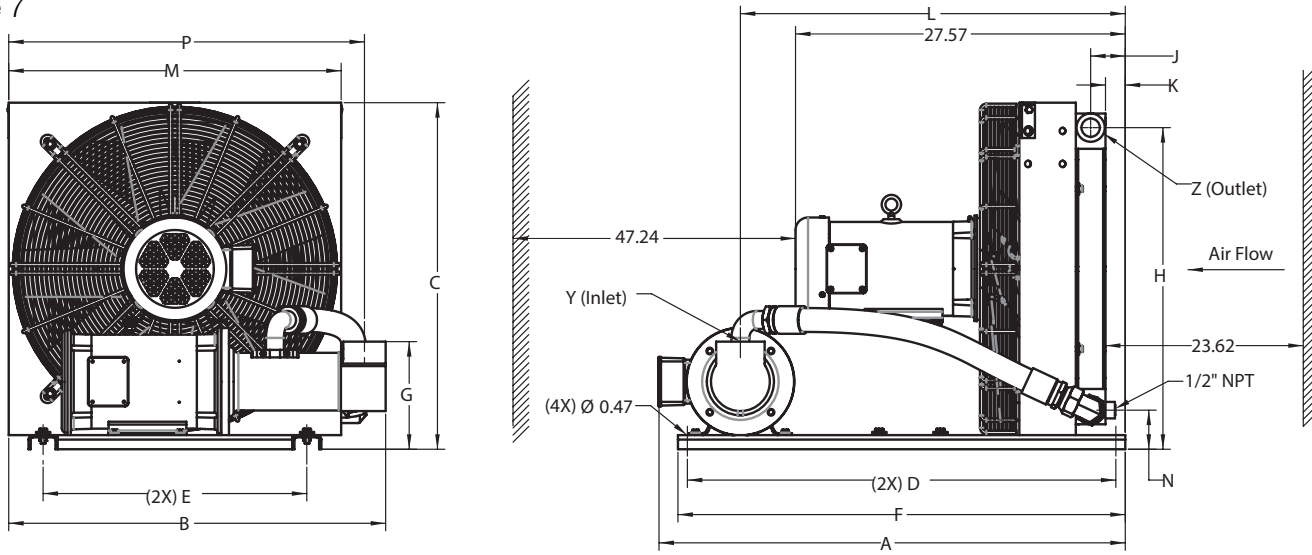
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	U	V	W	Y	Z
OKA4L, SB28	32.67	22.50	20.47	30.31	16.73	31.69	12.60	19.27	11.61	4.07	2.83	13.91	19.09	-	-	15.75	47.24	1-5/16"-12 (F)	1-5/16"-12 (F)
OKA4L, SB40	34.41	22.50	20.47	30.31	16.73	31.69	13.39	19.27	11.61	4.07	2.83	14.44	19.09	-	-	15.75	47.24	1-7/8"-12 (F)	1-5/16"-12 (F)
OKA5L, SB28	30.55	25.16	22.13	27.95	18.98	30.32	13.43	20.12	9.82	1.24	2.44	11.86	21.34	-	-	19.69	59.06	1-5/16"-12 (F)	1-5/16"-12 (F)
OKA5L, SB40	32.07	25.16	22.13	27.95	18.98	30.32	14.21	20.12	9.82	1.24	2.44	12.40	21.34	-	-	19.69	59.06	1-7/8"-12 (F)	1-5/16"-12 (F)
OKA6L, SB28	33.73	27.87	25.20	30.32	18.98	31.69	14.96	22.83	13.05	2.89	1.65	15.09	22.99	3.15	1/2" NPT	23.62	70.87	1-5/16"-12 (F)	1-5/8"-12 (F)
OKA6L, SB40	35.23	27.87	25.20	30.32	18.98	31.69	15.75	22.83	13.05	2.89	1.65	15.62	22.99	3.15	1/2" NPT	23.62	70.87	1-7/8"-12 (F)	1-5/8"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# OKA Series

Dimensions

Size 7

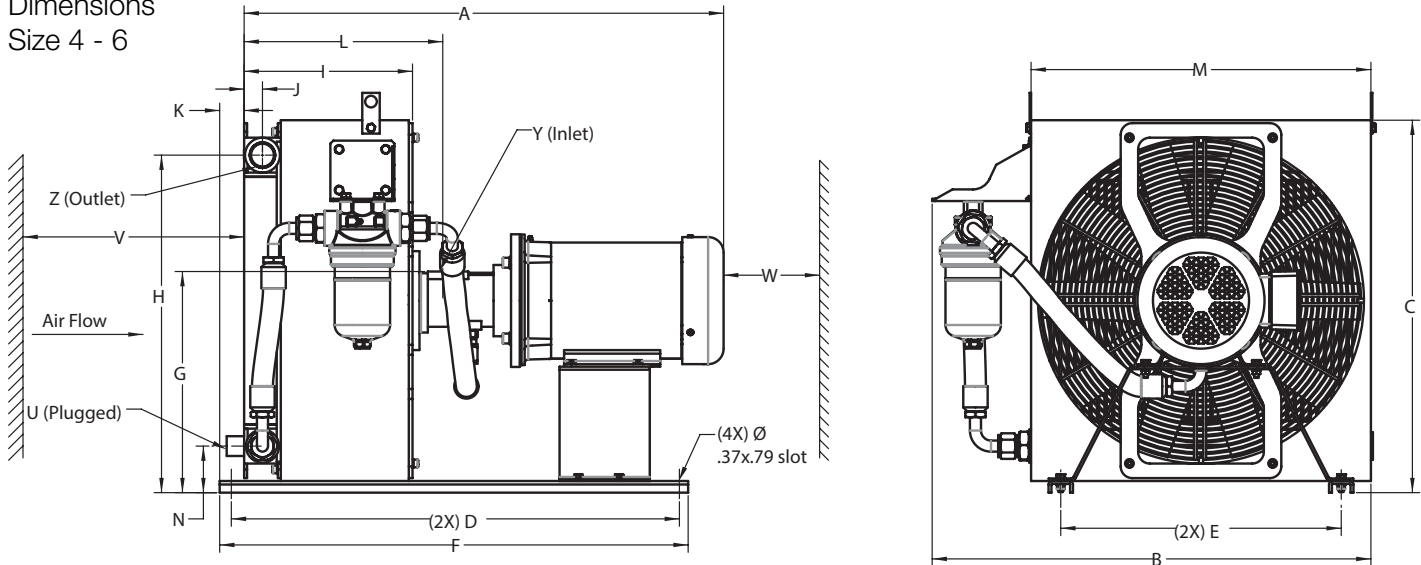


Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Y	Z
OKA7L, S3.6B70	39.05	31.52	28.98	35.83	22.05	37.4	9	26.89	2.89	1.65	32.18	27.8	3.27	29.74	SAE 2" Code 61 Flange	1-5/8"-12 (F)
OKA7L, S3.6B100	40.30	33.08	28.98	35.83	22.05	37.4	10.17	26.89	2.89	1.65	31.68	27.8	3.27	31.04	SAE 2-1/2" Code 61 Flange	1-5/8"-12 (F)

# OKAF Series

Dimensions

Size 4 - 6



Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	U	V	W	Y	Z
OKAF4L, SB28	32.67	25.79	20.47	30.31	16.73	31.69	12.60	19.27	11.61	4.07	2.83	13.91	19.09	-	-	15.75	47.24	1-5/16"-12 (F)	1-5/16"-12 (F)
OKAF4L, SB40	34.41	25.79	20.47	30.31	16.73	31.69	13.39	19.27	11.61	4.07	2.83	14.44	19.09	-	-	15.75	47.24	1-7/8"-12 (F)	1-5/16"-12 (F)
OKAF5L, SB28	30.55	29.34	22.13	27.95	18.98	30.32	13.43	20.12	9.82	1.24	2.44	11.86	21.34	-	-	19.69	59.06	1-5/16"-12 (F)	1-5/16"-12 (F)
OKAF5L, SB40	32.07	29.34	22.13	27.95	18.98	30.32	14.21	20.12	9.82	1.24	2.44	12.40	21.34	-	-	19.69	59.06	1-7/8"-12 (F)	1-5/16"-12 (F)
OKAF6L, SB28	33.73	31.00	25.20	30.32	18.98	31.69	14.96	22.83	13.05	2.89	1.65	15.09	22.99	3.15	1/2" NPT	23.62	70.87	1-5/16"-12 (F)	1-5/8"-12 (F)
OKAF6L, SB40	35.23	31.00	25.20	30.32	18.98	31.69	15.75	22.83	13.05	2.89	1.65	15.62	22.99	3.15	1/2" NPT	23.62	70.87	1-7/8"-12 (F)	1-5/8"-12 (F)

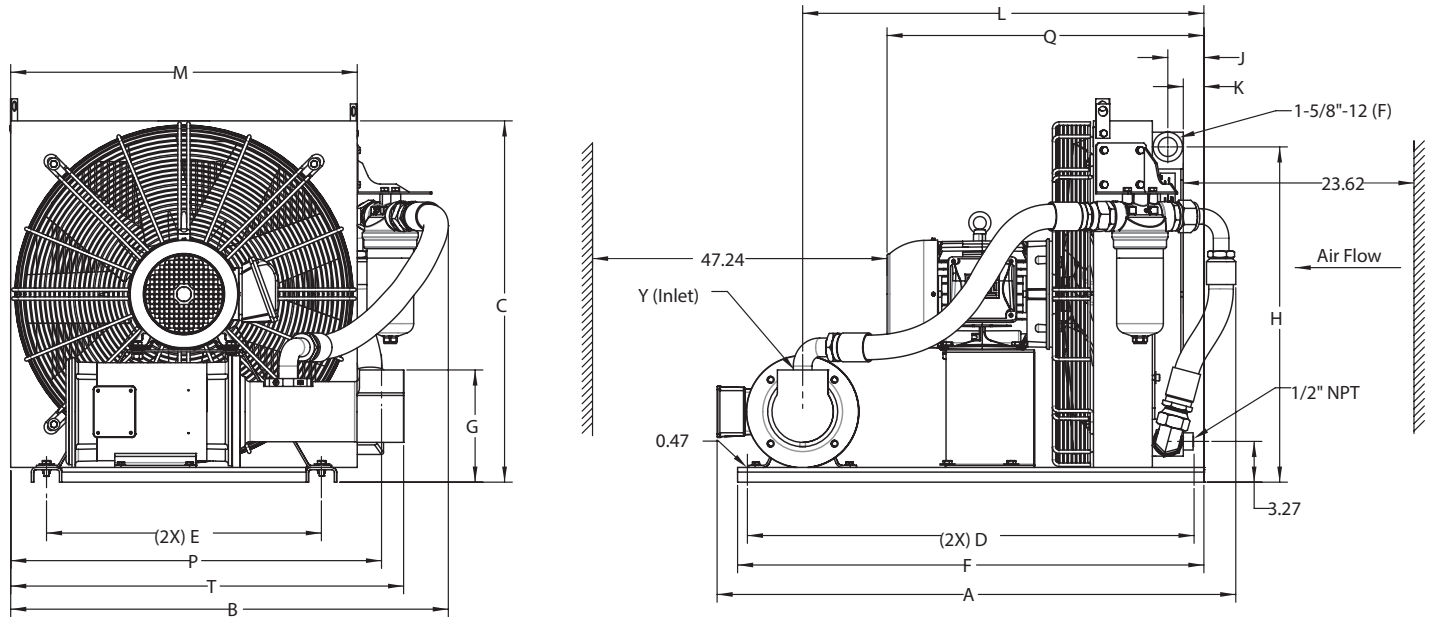
Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.



# OKAF Series

Dimensions

Size 7



Size	A	B	C	D	E	F	G	H	J	K	L	M	P	Q	T	Y
OKAF7L, S3.6B70	41.60	35.08	28.98	35.83	22.05	37.40	9	26.89	2.89	1.65	32.18	27.80	29.74	25.41	31.52	SAE 2" Code 61 Flange
OKAF7L, S3.6B100	41.60	35.08	28.98	35.83	22.05	37.40	10.17	26.89	2.89	1.65	31.68	27.80	31.04	25.41	33.08	SAE 2-1/2" Code 61 Flange

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# OK-LN Series - AC Motor Drive

Air Cooled Oil Coolers



## Description

The OK-LN series is the latest development in the HYDAC Air Cooler family. It is the optimized, low-noise version of the OK Series coolers. Sizes OK-LN 8-14 have a wide range of accessories and allow for flexible adaptation to various applications to cool industrial hydraulic systems.

## Features

- Highly efficient aluminum bar and plate style heat exchangers
- Externally mounted heat exchangers for easy maintenance and cleaning
- Modular pump and filter options for a plug and play fluid conditioning system
- Available with HYDAC MF and LPF series filters and FLND series filters
- Accessories Include: thermostats (adjustable and fixed), integrated thermostatic bypass valves, and pressure bypass valves
- Up to 200 HP cooling capacity
- Packaged systems with pump flows up to 62 gpm
- Maximum flows (w/o pump) up to 220 gpm

## Applications



Gearboxes



Industrial



Elevators



Power Generation



Pulp & Paper



Railways

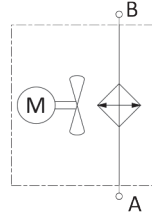


Shipbuilding

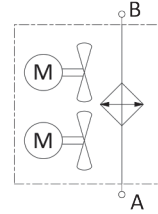


Steel / Heavy Industry

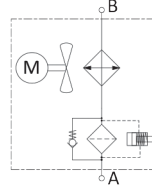
## Hydraulic Symbol OK-LN 8 -11



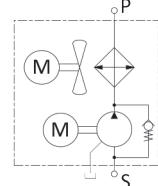
## OK-LN 12 -14



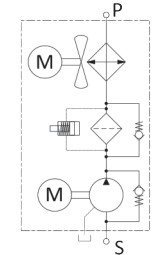
## OKF-LN 8-11



## OKA-LN 8-11



## OKAF 8 - 11



# Low Noise Solutions

## Product Development

HYDAC Cooling Systems engineers have utilized modern CFD technologies to carefully study the impact of shroud design, fan type, finger guard design, etc. on the cooling airflow, noise level, cooler performance and overall design efficiency. The goal was to achieve a significant decibel decrease with the cooler design while improving overall cooler efficiency. The result is the new OK-LN (Low Noise) product series.

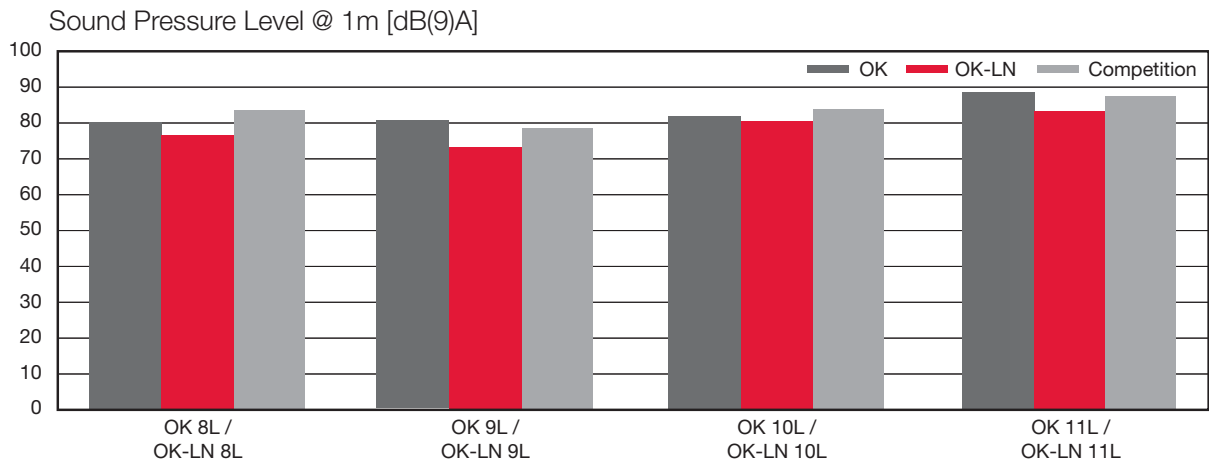
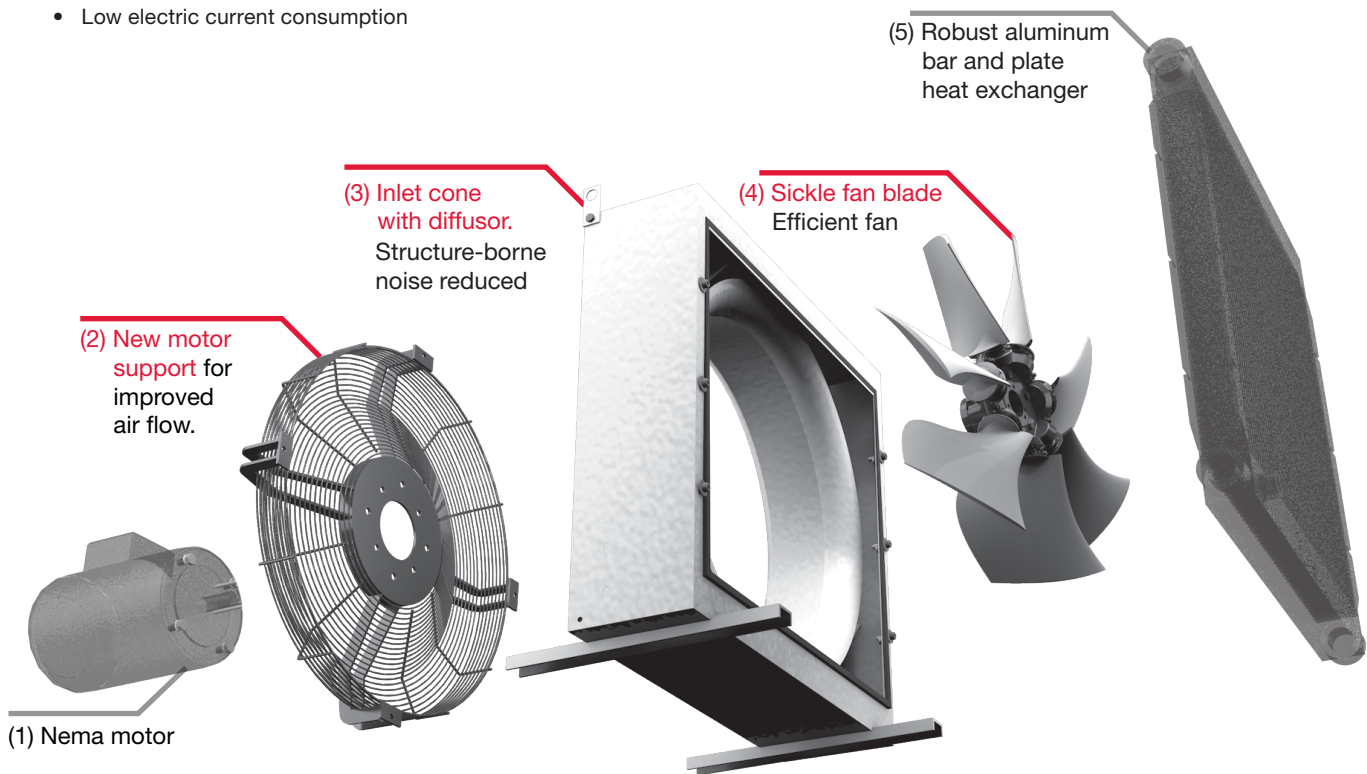
The new OK-LN cooler product line can be used in most industrial applications, where oil or a water-glycol mixture must be cooled using forced air. Typical applications include hydraulic circuits of industrial power units, gearboxes, tool-machines, transformers and others.

## Noise Reduction

- Optimized air stream
- Application of a high efficiency fan with special characteristic curve
- Housing design optimization, i.e. less vibration conduction
- Decibel levels reduced without compromise of fan speed or performance

## Product Series Characteristics

- Low noise
- High heat dissipation
- Low electric current consumption



Model Code

<b>Model</b>	OKAF-LN	8	L	3.6	B	70	MF195	3	B	AITR	IBT45-2
OK-	LN = Basic Cooler										
OKF-	LN = Cooler with filter (sizes 8-11 only)										
OKA-	LN = Cooler with circulator pump (sizes 8-11 only)										
OKAF-	LN = Cooler with circulator pump and filter (sizes 8-11 only)										
<b>Cooler Size</b>	8L, 8S, 9L, 10L, 11L, 12L, 14L, 14S										
<b>Motor / Fan Speed Designations</b>	L = 1200 RPM S = 1800 RPM										
<b>Modification Number (latest version always supplied)</b>											
<b>Motor</b>	B = 208-230/460 volt- 3PH C = 575 volt-3 PH (other voltages available upon request)										
<b>Pump</b>	(omit) = No Pump for OK/OKF models 70 = 70 ccm/rev, L/S = 34.3 gpm 100 = 100 ccm/rev, L/S = 47.5 gpm 130 = 130 ccm/rev, L/S = 61.8 gpm										
<b>Filter Type</b>	(omit) = No filter MF195 = Spin-on 60 rated gpm LPF240 = Cartridge filter 63 rated gpm LPF280 = Cartridge filter 73 rated gpm FLND 250 = Duplex filter 66 rated gpm FLND 400 = Duplex filter 105 rated gpm										
<i>Note: Other return line filters are available upon request. Consult the HYDAC Hydraulic &amp; Lube Oil Filters catalog for special fluids.</i>											
<b>Micron Rating</b>	(omit) = No filter / OK and OKA models 3 = 3 micron, Absolute 5 = 5 micron, Absolute (MF + LPF only) 6 = 6 micron, Absolute (FLND Only) 10 = 10 micron, Absolute 20 = 20 micron, Absolute (MF + LPF only) 25 = 25 micron, Absolute (FLND Only)										
<b>Filter Indicator</b>	(omit) = No filter B = Visual C = Electrical (AC/DC) (LPF + FLND filters only) D24 = Visual (lamp) and Electrical (switch) Numbers indicate supply voltage for light D115 = Visual (lamp) and Electrical (switch) (LPF + FLND filters only) D230 = Visual (lamp) and Electrical (switch)										
<b>Accessories</b>	(omit) = None TR1 = Reservoir Thermostat, adjustable 32° to 200°F* (*Must be ordered separately) AITR = Inline Thermostat, adjustable 32° to 200°F TS-120 = Inline Thermostat, fixed 120°F TS-140 = Inline Thermostat, fixed 140°F Only available with OK & OKF Units TS-160 = Inline Thermostat, fixed 160°F (additional set points available - consult factory) IBT = Thermostatic bypass valve IBP = Integrated pressure bypass valve										
<b>Opening Temperature (IBT only)</b>	Opening Temp. Closing Temp. 45 = 113°F (45°C) 131°F (55°C) 50 = 130°F (55°C) 150°F (65°C) 60 = 140°F (60°C) 158°F (70°C)										
<b>Opening Pressure Drop (IBT &amp; IBP only)</b>	2 = 2 bar (29 psi) 3 = 3 bar (45 psi) 4 = 4 bar (58 psi) (IBP only)										

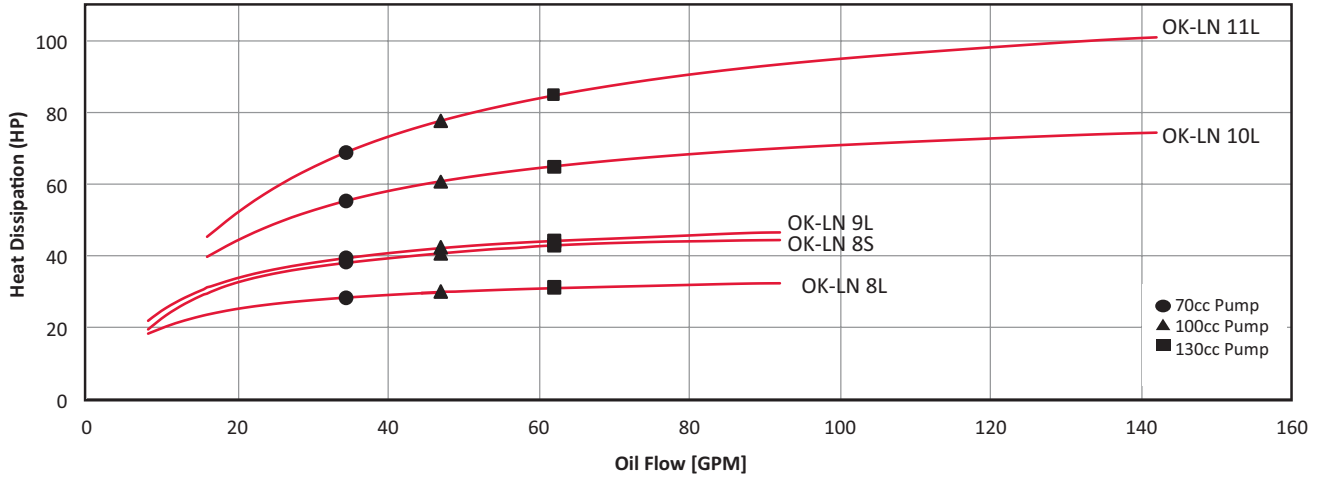
# OK-LN Series

Heat Dissipation @  $\Delta T = 40^\circ\text{F}$

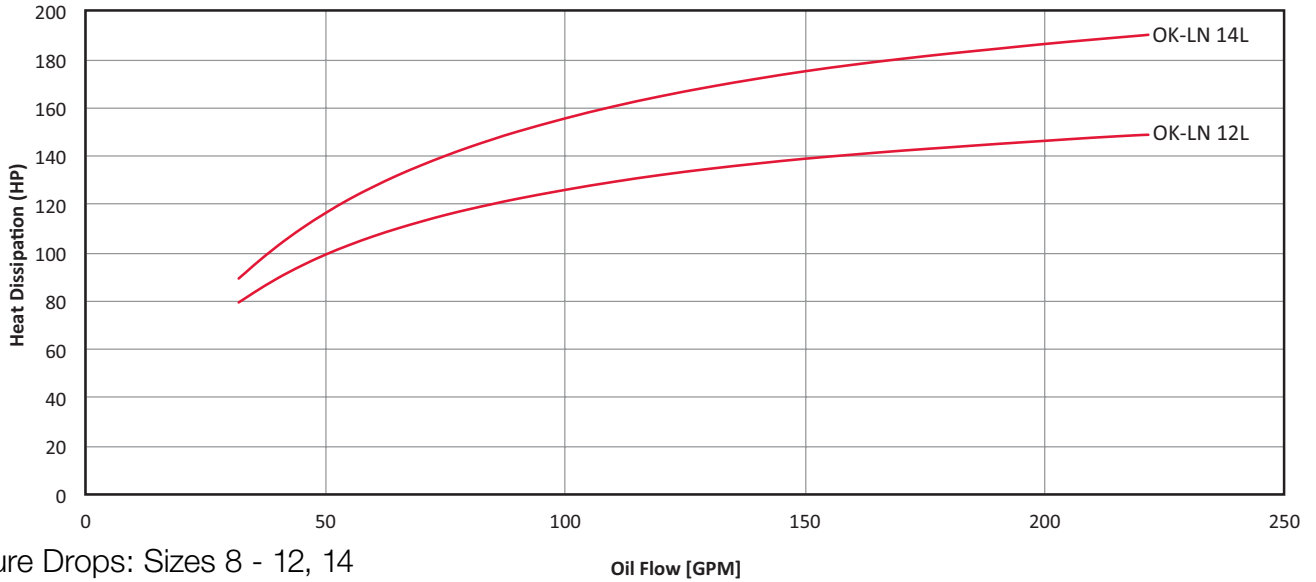
(tolerance  $\pm 5\%$ )

Cooling capacity depending on oil flow and the temperature differential  $\Delta T$  between the oil inlet and air temperature.

Sizes 8 - 11



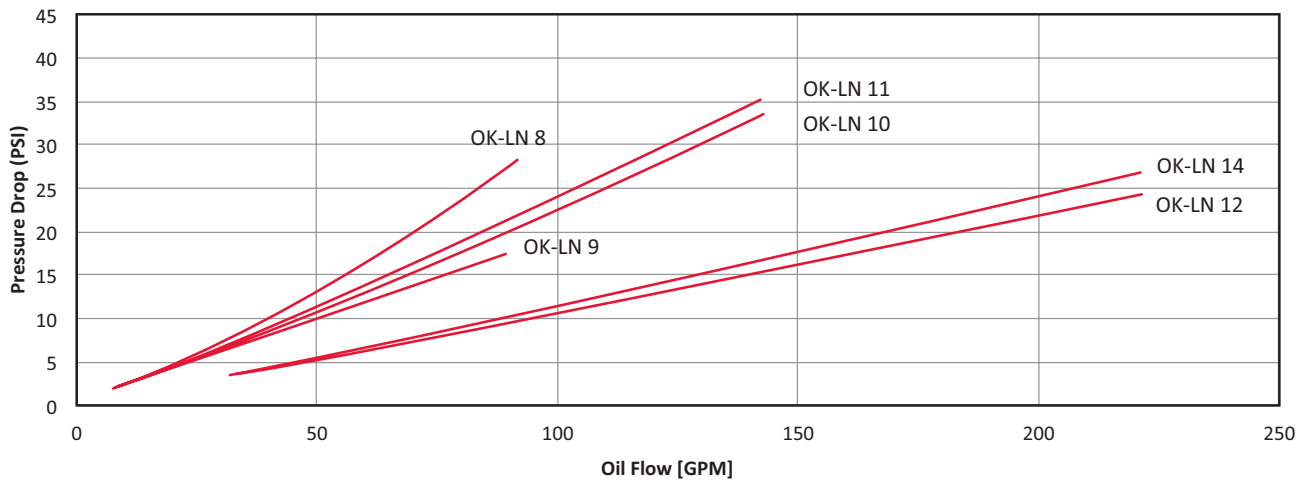
Sizes 12, 14



Pressure Drops: Sizes 8 - 12, 14

@ 30cSt

(tolerance  $\pm 5\%$ )



For other viscosities, the result must be multiplied by the K factors on the following page.

## K Factor Chart

Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3

## General

<b>Construction</b>	<b>Housing</b>	Welded steel housing
	<b>Heat Exchanger</b>	Aluminum Heavy duty bar and plate
	<b>Motors</b>	NEMA frame style TEFC
	<b>Fan</b>	Plastic
	<b>Mounting foot and motor stand</b>	Steel
<b>Mounting Orientation</b>		Horizontal, motor shaft
<b>Maximum Pressure</b>	<b>w/o pump</b>	230 psi (16 bar) Dynamic 290 psi (20 bar) Static
	<b>with pump</b>	145 psi (10 bar)
<b>Fluids</b>		Mineral oil to DIN 51524 Part 1 and 2 Permissible contamination < NAS 12
<b>Maximum Oil Viscosity</b>	<b>w/o pump</b>	2000 cst
	<b>w/ pump</b>	180cst
<b>Maximum Oil Temperature</b>	<b>w/o pump</b>	266° F (130°C)
	<b>with pump</b>	176° F (80°C)
<b>Air Flow Direction</b>		Pulled across heat exchanger

## Specifications

Models	Set Up	Maximum Oil Flow gpm	Pump Displacement Per Pump Code Level gpm			Noise dBa*1	Motor Specifications		RPM
							(Fan) HP	(Pump)	
OK-LN 8L, OKF-LN 8L	Fan	74	NA			75.9	1.5	NA	1200
OKA-LN 8L, OKAF-LN 8L	Fan w/ pump	-	70cc/rev 34.3 gpm	100 cc/rev 47.5 gpm	130 cc/rev 61.8 gpm	TBD	1.5	5 (70cc/rev) 7.5 (100cc/rev) 10 (130cc/rev)	1200 / 1800
OK-LN 8S, OKF-LN 8S	Fan	74	NA			82.7	3	NA	1800
OKA-LN 8S, OKAF-LN 8S	Fan w/ pump	-	70cc/rev 34.3 gpm	100 cc/rev 47.5 gpm	130 cc/rev 61.8 gpm	TBD	3	5 (70cc/rev) 7.5 (100cc/rev) 10 (130cc/rev)	1800/ 1800
OK-LN 9L, OKF-LN 9L	Fan	79	NA			73	1.5	NA	1200
OKA-LN 9L, OKAF-LN 9L	Fan w/ pump	-	70cc/rev 34.3 gpm	100 cc/rev 47.5 gpm	130 cc/rev 61.8 gpm	TBD	1.5	5 (70cc/rev) 7.5 (100cc/rev) 10 (130cc/rev)	1200 / 1800
OK-LN 10L, OKF-LN 10L	Fan	79	NA			80.1	3	NA	1200
OKA-LN 10L, OKAF-LN 10L	Fan w/ pump	-	70cc/rev 34.3 gpm	100 cc/rev 47.5 gpm	130 cc/rev 61.8 gpm	TBD	3	5 (70cc/rev) 7.5 (100cc/rev) 10 (130cc/rev)	1200 / 1800
OK-LN 11L, OKF-LN 11L	Fan	79	NA			83.5	5	NA	1200
OKA-LN 11L, OKAF-LN 11L	Fan w/ pump	-	70cc/rev 34.3 gpm	100 cc/rev 47.5 gpm	130 cc/rev 61.8 gpm	TBD	5	5 (70cc/rev) 7.5 (100cc/rev) 10 (130cc/rev)	1200 / 1800
OK-LN 12L	Fan	220	NA			83.1	(2x) 3	NA	1200
OK-LN 14L	Fan	220				86.5	(2x) 5	NA	1200
OK-LN 14S	Fan	220				TBD	(2x) 7.5	NA	1800

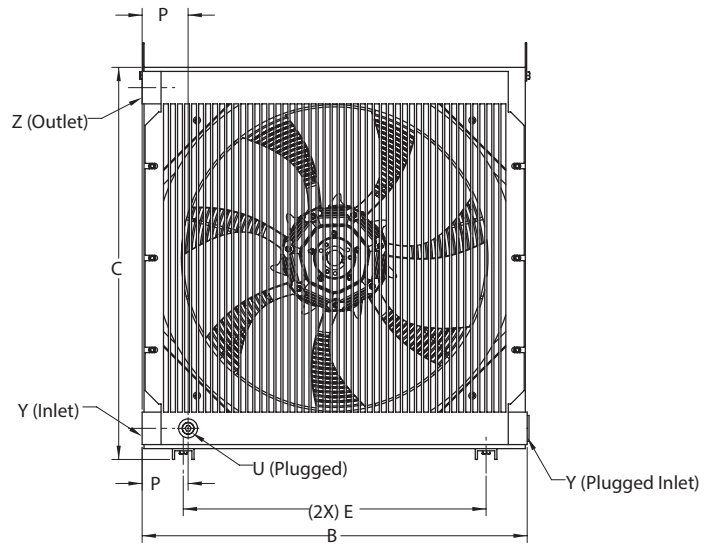
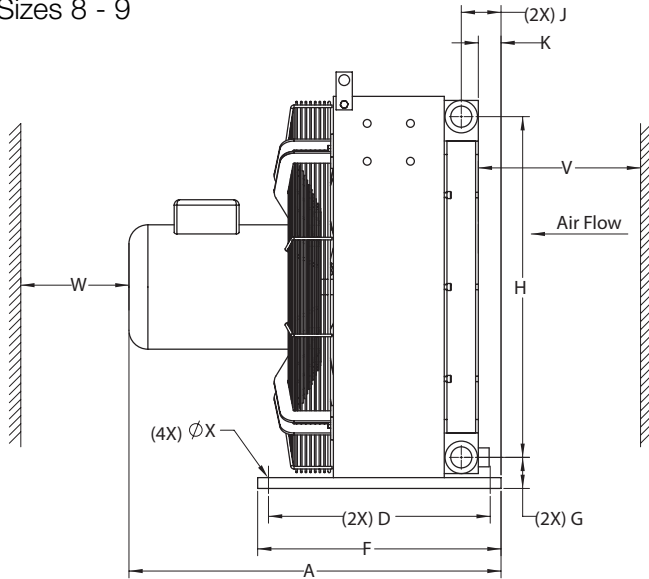
\*The noise levels are only a guide as acoustic properties depend on the characteristics of the room, connections, viscosity and resonance.

1) 3 Phase Motor

# OK-LN Series

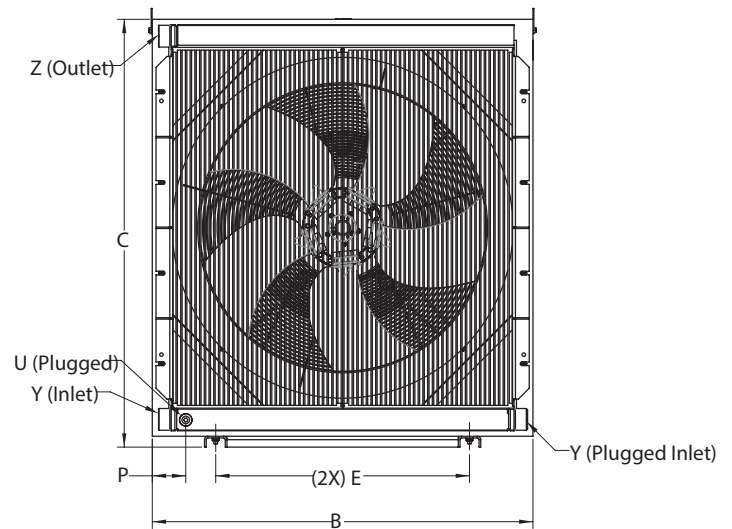
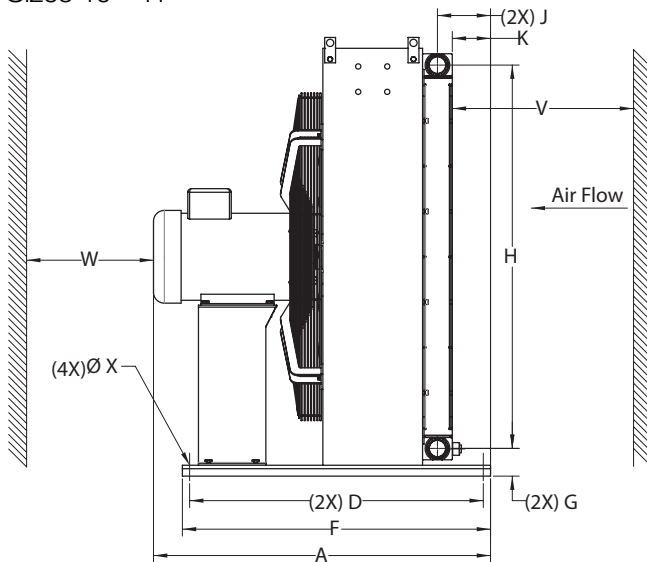
Dimensions

Sizes 8 - 9



Size	A	B	C	D	E	F	G	H	I
OKLN8L,S3.6B	27.09	27.76	28.54	16.14	22.05	17.72	2.26	24.80	2.89
OKLN9L3.6B	33.15	31.10	34.65	29.53	27.56	31.10	3.01	29.80	5.83
	K	P	U	V	W	X	Y	Z	
OKLN8L,S3.6B	1.65	3.21	1/2" NPT	23.62	47.24	Ø.35x.78 Slot	1-5/8"-12 (F)	1-5/8"-12 (F)	
OKLN9L3.6B	4.21	3.34	1/2" NPT	35.43	98.43	0.47	1-7/8"-12 (F)	1-7/8"-12 (F)	

Sizes 10 - 11



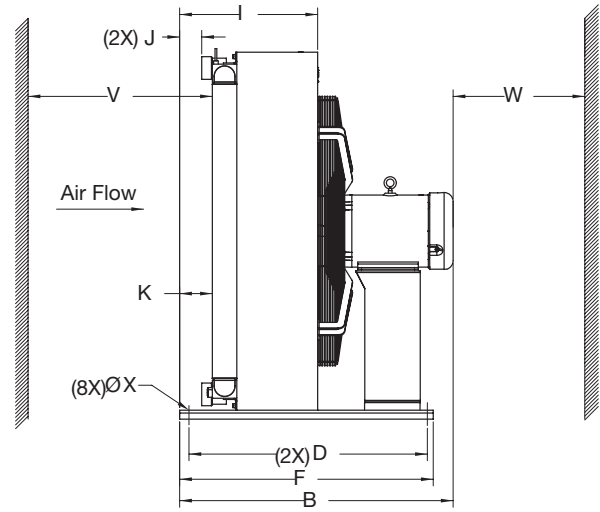
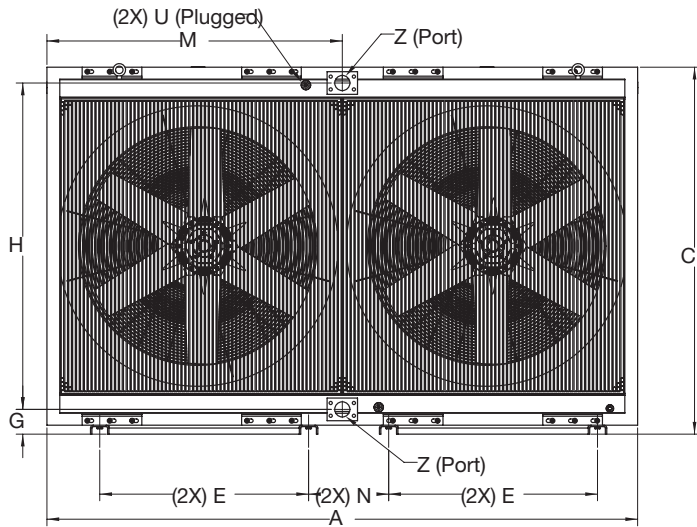
Size	A	B	C	D	E	F	G	H	J
OKLN10L3.6B	36.09	36.61	40.55	31.89	27.56	33.46	2.95	35.83	6.31
OKLN11L3.6B	36.60	41.34	46.46	31.89	27.56	33.46	3.01	41.61	5.77
	K	P	U	V	W	X	Y	Z	
OKLN10L3.6B	4.23	3.72	1/2" NPT	35.43	110.24	0.47	1-7/8"-12 (F)	1-7/8"-12 (F)	
OKLN11L3.6B	4.15	3.63	1/2" NPT	39.37	118.11	0.47	1-7/8"-12 (F)	1-7/8"-12 (F)	

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# OK-LN Series

Dimensions

Sizes 12 - 14

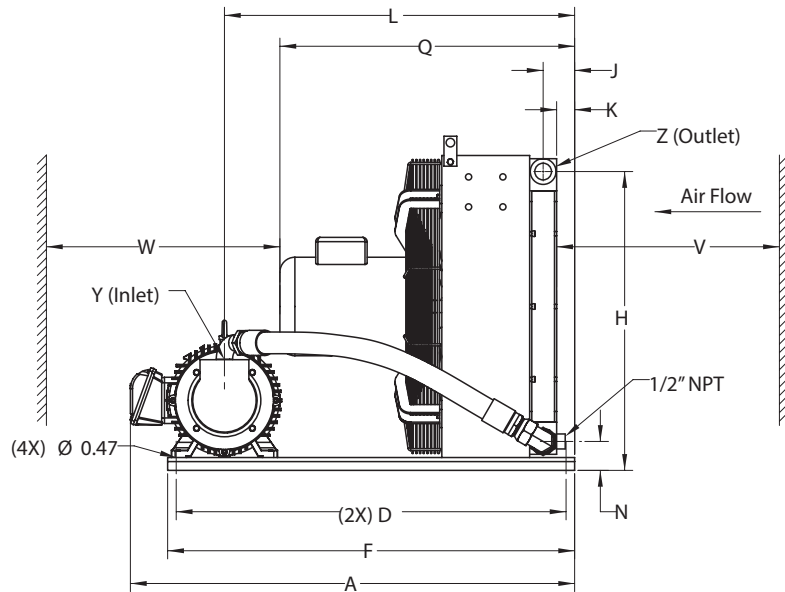
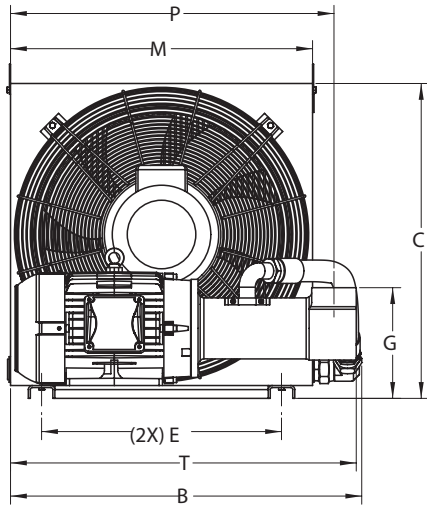


Size	A	B	C	D	E	F	G	H	I	J
OKLN12	72.84	36.6	43.7	31.89	27.56	33.47	3.94	37.01	18.21	2.76
OKLN14	77.95	36.09	48.43	31.89	27.56	33.47	3.27	43.07	18.21	2.76
	K	M	N	U2	V	W	X	Z		
OKLN12	4.16	36.42	8.86	1/2" NPT (F)	35.43	110.24	0.47	2" SAE Code 61 Flange Port		
OKLN14	4.16	38.98	10.57	1/2" NPT (F)	39.37	118.11	0.47	2" SAE Code 61 Flange Port		

# OKA-LN Series

Dimensions

Sizes 8, 9



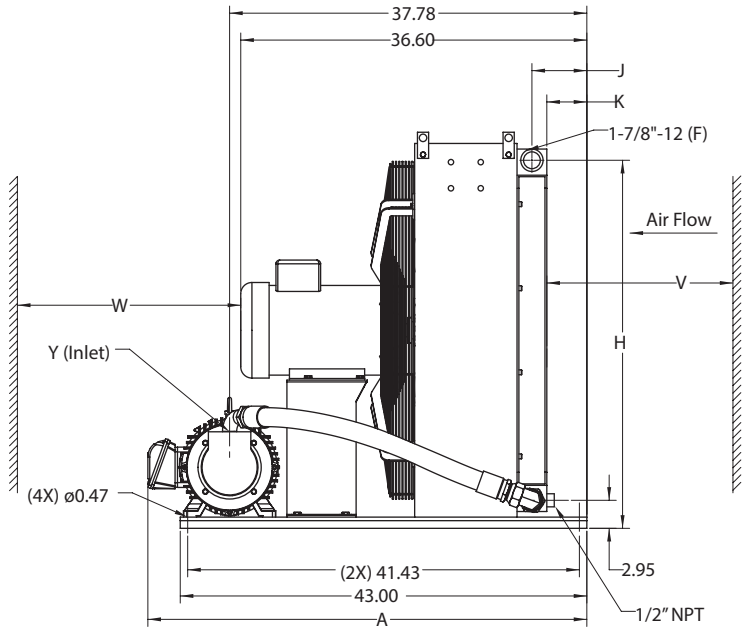
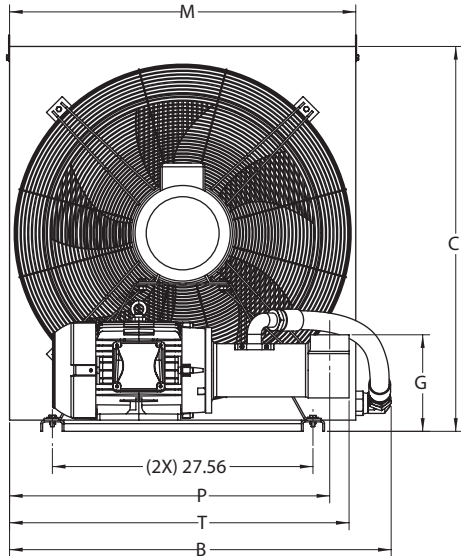
Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	T	V	W	Y	Z
8L,S3.6B70	39.05	32.24	28.94	35.83	22.05	37.40	9.00	27.46	2.89	1.65	32.18	27.76	2.66	29.72	27.09	31.50	23.62	47.24	SAE 2"	1-5/8"-12 (F)
8L,S3.6B100,130	40.85	32.24	28.94	35.83	22.05	37.40	10.17	27.46	2.89	1.65	32.18	27.76	2.66	29.72	27.09	31.77	23.62	47.24	SAE 2-1/2"	1-5/8"-12 (F)
9L,S3.6B70	44.64	35.48	34.65	41.43	27.56	43.00	9.00	32.82	5.83	4.21	37.78	31.10	2.95	31.10	33.15	32.87	35.43	98.43	SAE 2"	1-7/8"-12 (F)
9L,S3.6B100,130	46.45	35.48	34.65	41.43	27.56	43.00	10.17	32.82	5.83	4.21	37.78	31.10	2.95	31.10	33.15	33.15	35.43	98.43	SAE 2-1/2"	1-7/8"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.



# OKA-LN Series

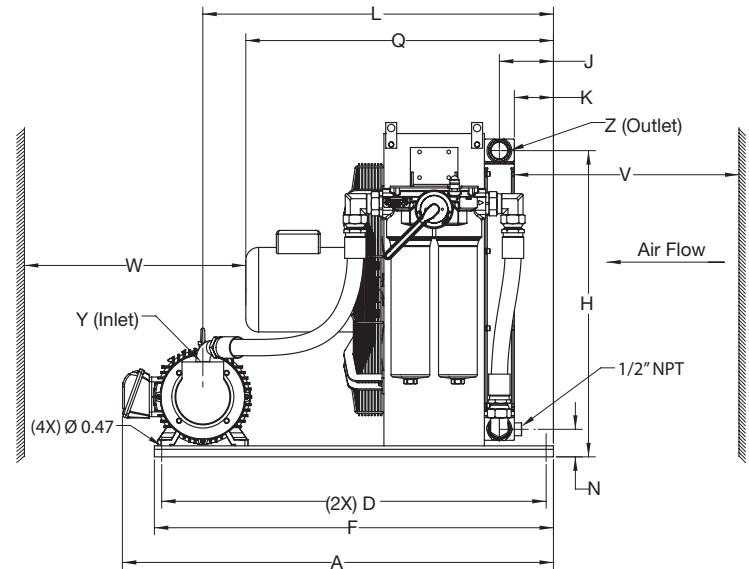
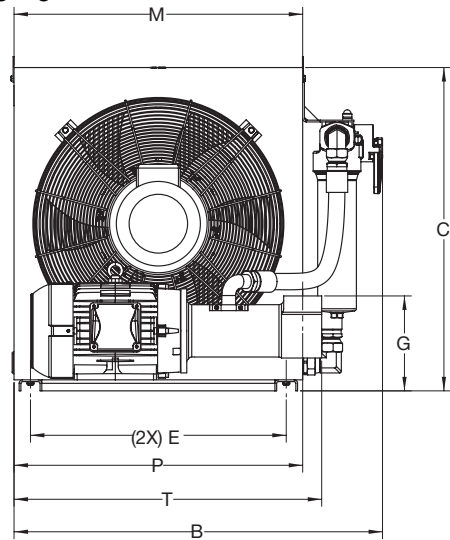
Dimensions  
Sizes 10, 11



Size	A	B	C	G	H	J	K	M	P	T	V	W	Y
OKALN10L3.6B70	44.64	40.44	40.55	9.00	38.78	5.81	4.23	36.61	33.86	35.63	35.43	110.24	SAE 2" Code 61 Flange
OKALN10L3.6B100,130	46.45	40.44	40.55	10.17	38.78	5.81	4.23	36.61	33.86	35.91	35.43	110.24	SAE 2-1/2" Code 61 Flange
OKALN11L3.6B70	44.64	44.94	46.46	9.00	44.64	5.77	4.15	41.34	36.22	37.99	39.37	118.11	SAE 2" Code 61 Flange
OKALN11L3.6B100,130	46.45	44.94	46.46	10.17	44.64	5.77	4.15	41.34	36.22	38.27	39.37	118.11	SAE 2-1/2" Code 61 Flange

# OKAF-LN Series

Dimensions  
Sizes 8 - 9



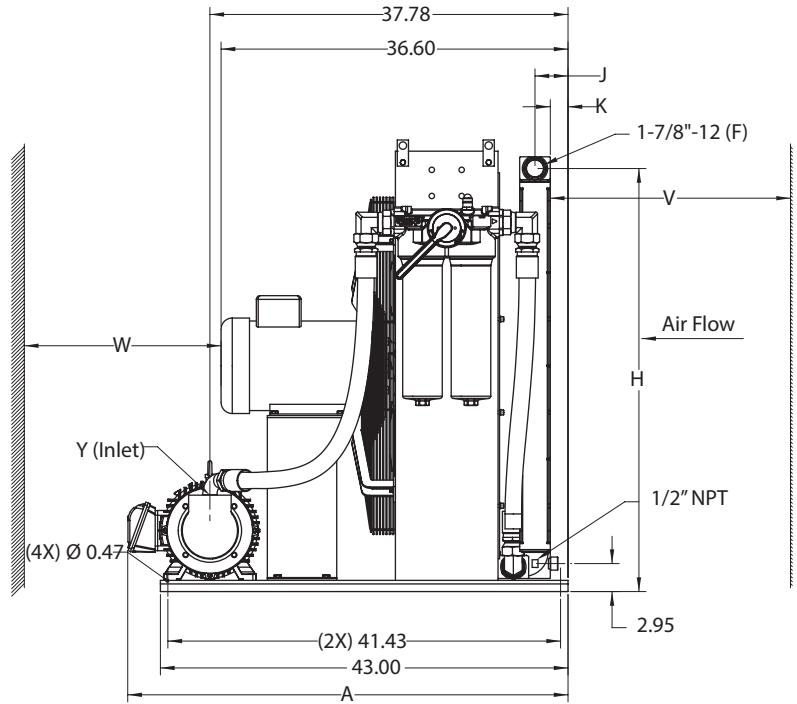
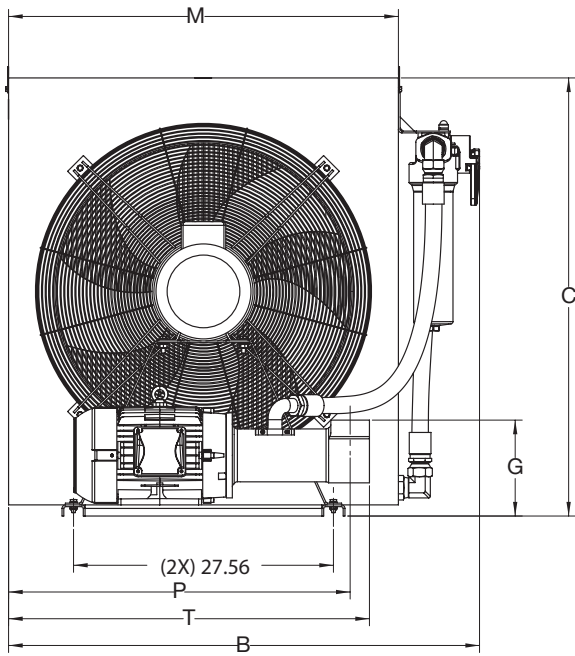
Size	A	B	C	D	E	F	G	H	J	K	L
OKAFLN8L,S3.6B70	39.05	36.36	28.94	35.83	22.05	37.40	9.00	27.46	2.89	1.65	32.18
OKAFLN8L,S3.6B100,130	40.85	36.36	28.94	35.83	22.05	37.40	10.17	27.46	2.89	1.65	32.18
OKAFLN9L,S3.6B70	44.64	39.70	34.65	41.43	27.56	43.00	9.00	32.82	5.83	4.21	37.78
OKAFLN9L,S3.6B100,130	46.45	39.70	34.65	41.43	27.56	43.00	10.17	32.82	5.83	4.21	37.78
	M	N	P	Q	T	V	W	Y		Z	
OKAFLN8L,S3.6B70	27.76	2.66	29.72	27.09	31.50	23.62	47.24	SAE 2" Code 61 Flange		1-5/8"-12 (F)	
OKAFLN8L,S3.6B100,130	27.76	2.66	29.72	27.09	31.77	23.62	47.24	SAE 2-1/2" Code 61 Flange		1-5/8"-12 (F)	
OKAFLN9L,S3.6B70	31.10	2.95	31.10	33.15	32.87	35.43	98.43	SAE 2" Code 61 Flange		1-7/8"-12 (F)	
OKAFLN9L,S3.6B100,130	31.10	2.95	31.10	33.15	33.15	35.43	98.43	SAE 2-1/2" Code 61 Flange		1-7/8"-12 (F)	

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# OKAF-LN Series

Dimensions

Sizes 10 - 11



Size	A	B	C	G	H	J	K	M	P	T	V	W	Y
OKAFLN10L3.6B70	44.64	45.21	40.55	9.00	38.78	5.81	4.23	36.61	33.86	35.63	35.43	110.24	SAE 2" Code 61 Flange
OKAFLN10L3.6B100,130	46.45	45.21	40.55	10.17	38.78	5.81	4.23	36.61	33.86	35.91	35.43	110.24	SAE 2-1/2" Code 61 Flange
OKAFLN11L3.6B70	44.64	49.94	46.46	9.00	44.64	5.77	4.15	41.34	36.22	37.99	39.37	118.11	SAE 2" Code 61 Flange
OKAFLN11L3.6B100,130	46.45	49.94	46.46	10.17	44.64	5.77	4.15	41.34	36.22	38.27	39.37	118.11	SAE 2-1/2" Code 61 Flange

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.



# ELD M Series

Rear Mounted NEMA Motor Cooler



## Description

These coolers are designed with a durable brazed bar and plate type heat exchanger for high efficiency. Included with the cooler package is a shroud with gasket to seal to the motor fan and adjustable mounting feet.

## Features

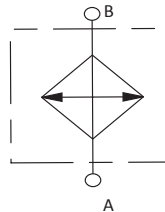
- Coolers to mount on rear of TEFC frame motors
- Power unit case drain coolers
- 3 sizes
- Utilizes ELD standard cores and shrouds.
- Air filter available upon request

## Applications



*Industrial*

## Hydraulic Symbol



## Specifications

Size	TEFC Motor Frame Size	Part Number
ELD1.5M	48-184	2595792
ELD2M	213-256	2595793
ELD3M	254-365	2595794

## Model Code

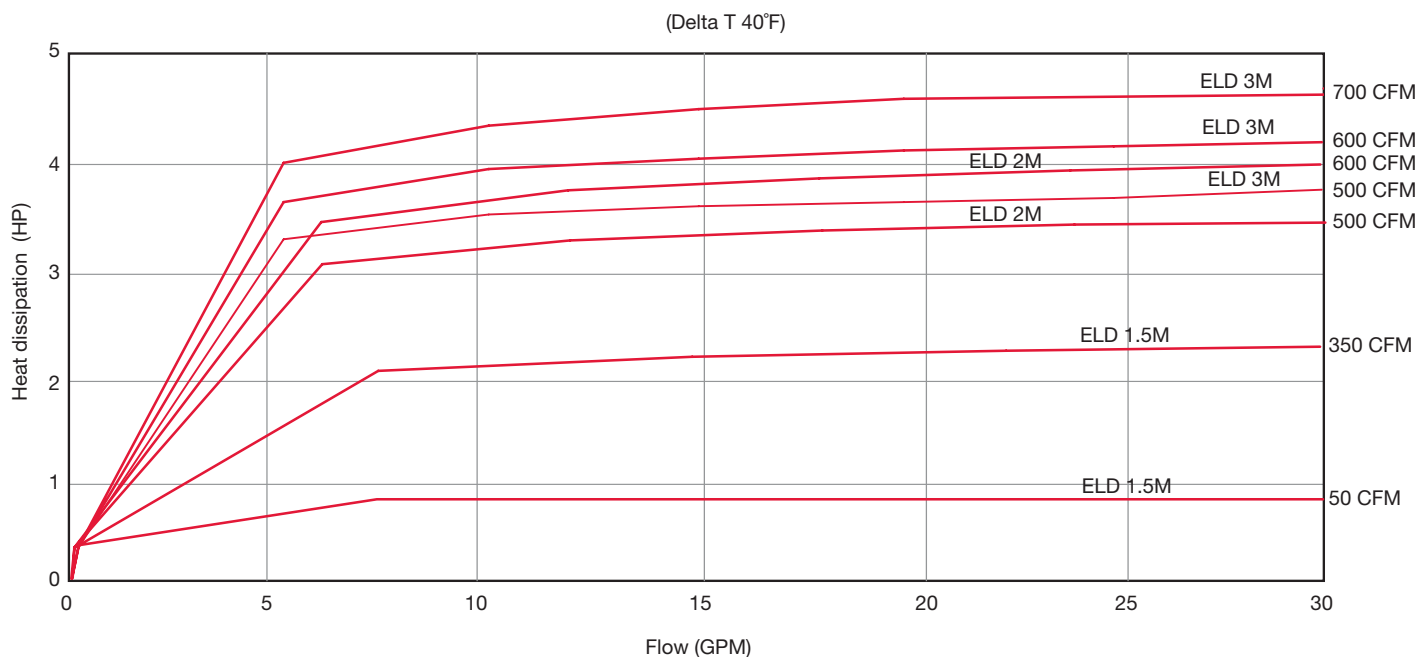
**Model** \_\_\_\_\_ ELD = Air Cooled Oil Cooler

**Size**  
1.5M  
2M  
3M

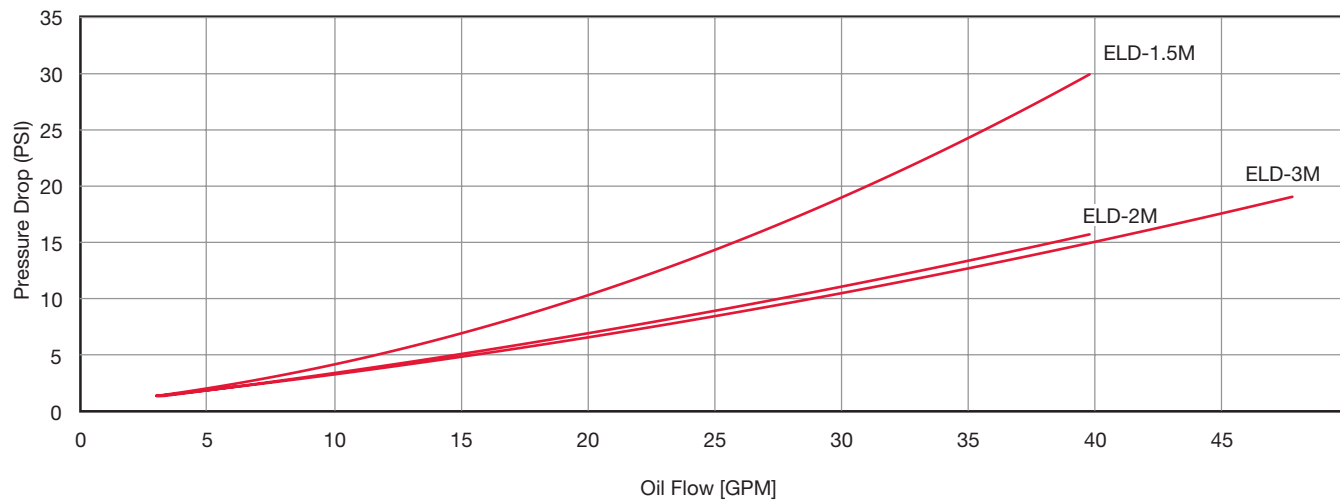
**Modification Number (latest version always supplied)** \_\_\_\_\_

ELD 1.5M 1.5

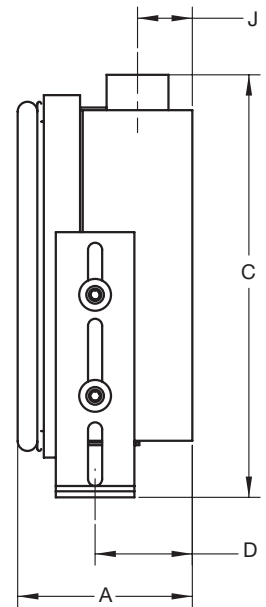
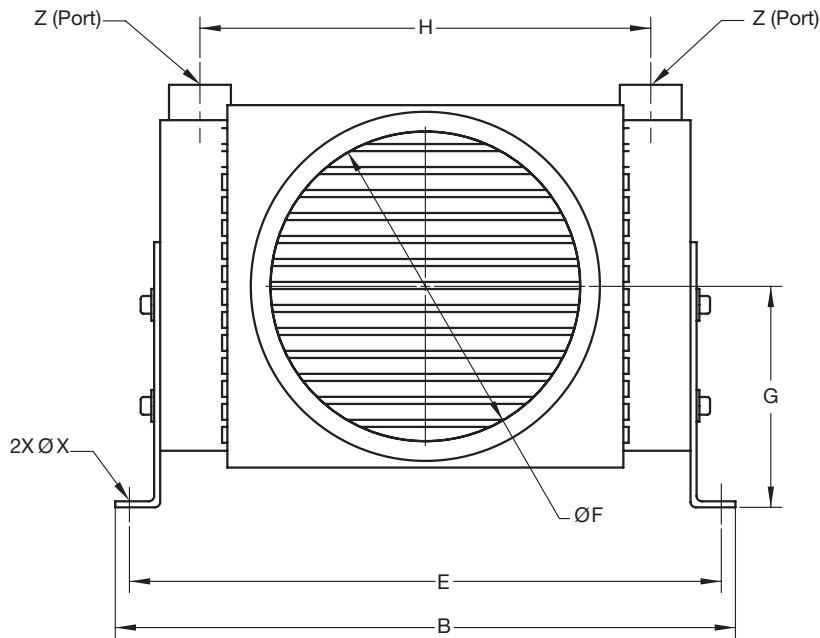
Cooling Capabilities  
 Sizes ELD 1.5M, 2M, 3M  
 Heat Dissipation @  $\Delta T=40^{\circ}\text{F}$   
 (tolerance:  $\pm 5\%$ )



Pressure Drop @ 30 cSt  
 (tolerance:  $\pm 5\%$ )

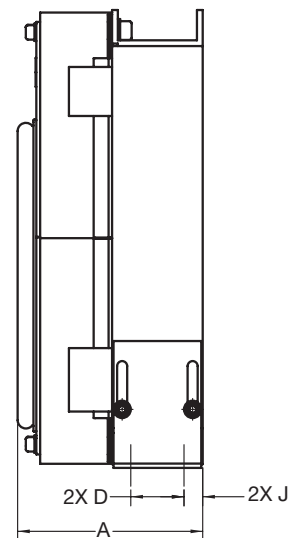
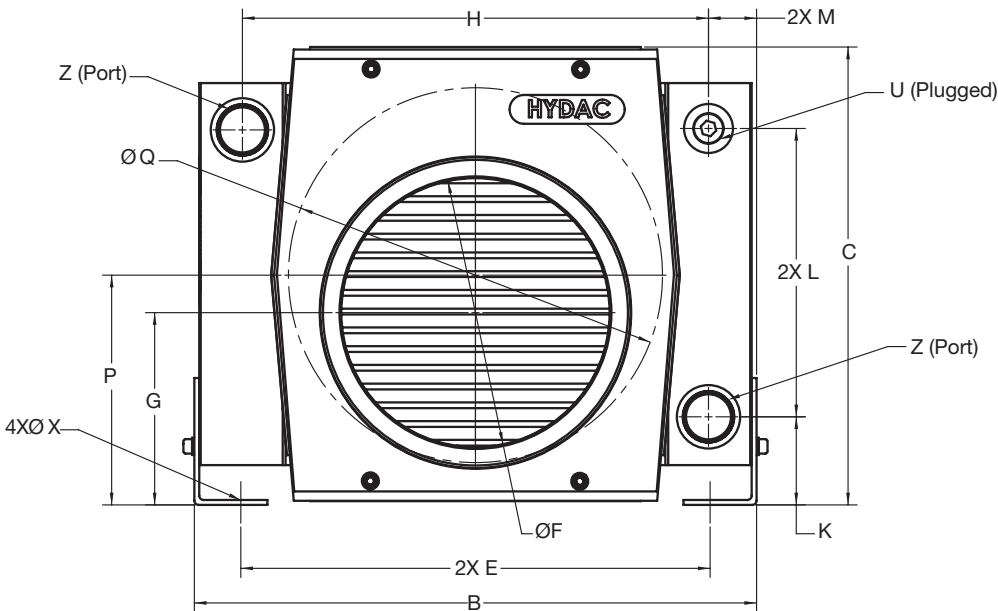


Dimensional Detail  
Size 1.5



A	B	C	D	E	F	G	H	J	X	Z
3.90	13.81	9.41 - 10.43	2.17	13.18	6.89	4.92 - 5.94	10.04	1.22	0.35	1-1/16"-12 (F)

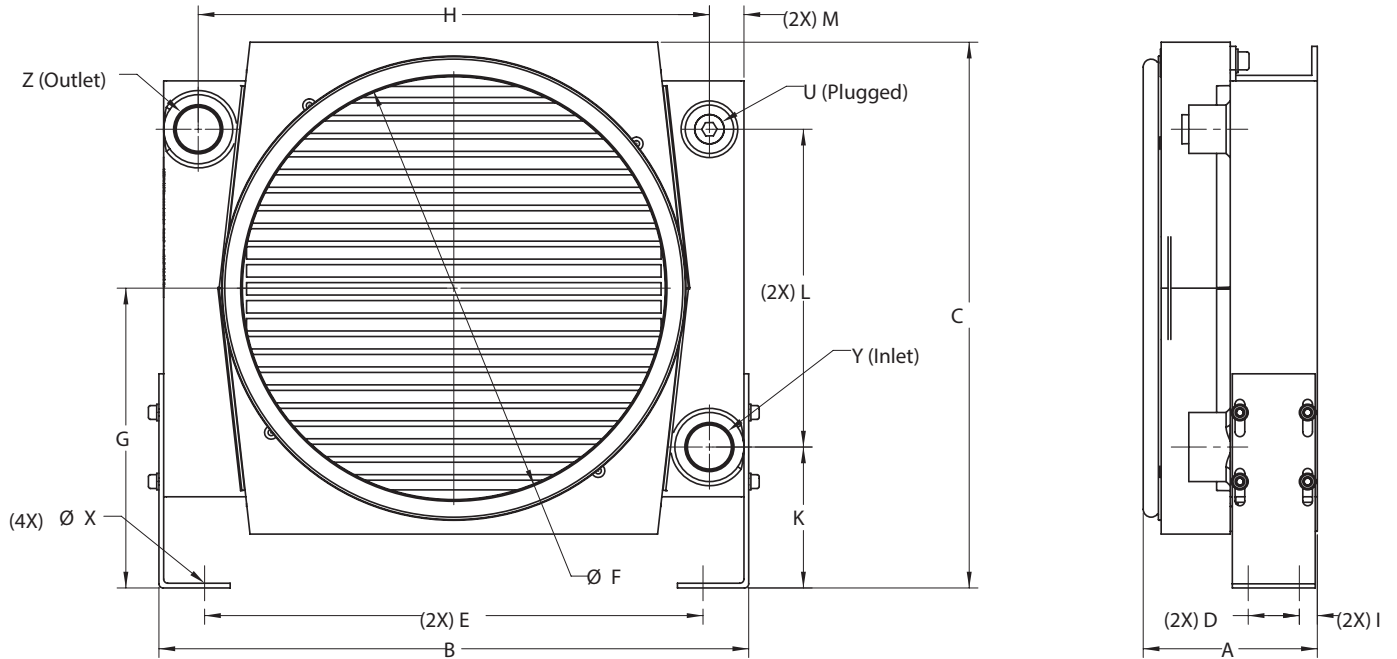
Dimensional Detail  
Size ELD 2M



A	B	C	D	E	F	G	H	J	K	L	M	P	Q	U	X	Y	Z
5.07	15.39	12.50 - 13.68	1.46	12.84	7.34	5.25 - 6.43	12.76	0.51	2.41 - 3.59	7.87	1.32	6.27 - 7.45	10.24	1/2" NPT	Ø.35x.55 slot	1-5/16"-12 (F)	1-5/16"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.  
Dimensions are in inches.

Dimensional Detail  
Size ELD 3M

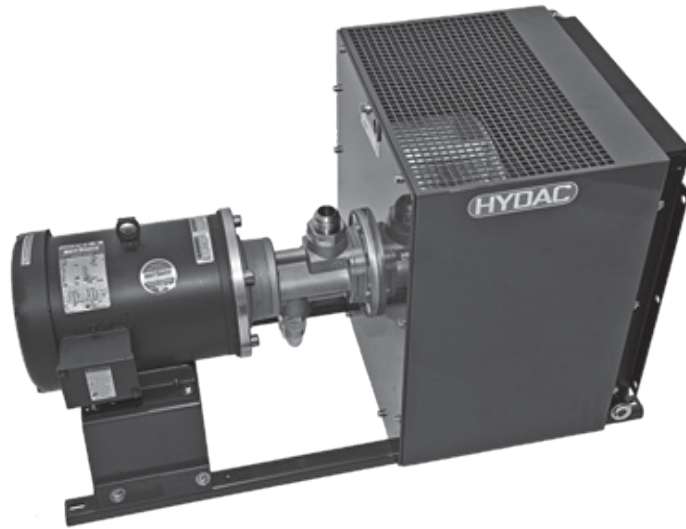


A	B	C	D	E	F	G	H	I	K	L	M	U	X	Y	Z
5.07	16.80	15.55 - 16.34	1.46	14.20	12.05	8.54 - 9.33	14.57	0.51	4.02 - 4.80	9.06	0.98	1/2" NPT	Ø.35x.55 slot	1-5/16"-12 (F)	1-5/16"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# SC Series - AC Motor Drive

Air Cooled Oil Coolers



## Description

The SC Series cooler design uses a large radial blower wheel assembly to pull air through the heat exchanger and then exit from the top. This combination offers excellent cooling capacity with low noise.

## Features

- Highly efficient aluminum bar and plate style heat exchangers
- Externally mounted heat exchangers for easy maintenance and cleaning
- Modular pump and filter options for a plug and play fluid conditioning system
- Available with HYDAC MF and LPF series filters
- Accessories Include: Thermostats (*adjustable and fixed*), Integrated thermostatic bypass valves, and pressure bypass valves
- Down to 64 dBA noise level
- Up to 16 HP cooling capacity
- Warm air is directed up and away from work area
- Packaged systems with pump flows ranging from 3.1 gpm to 18.5 gpm
- Maximum flows (*w/o pump*) up to 42 gpm

## Applications



Gearboxes



Industrial



Elevators



Power Generation



Pulp & Paper



Railways

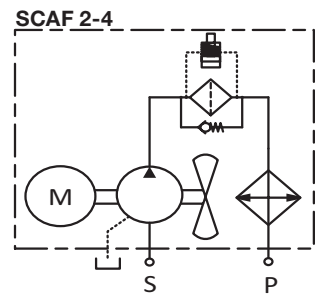
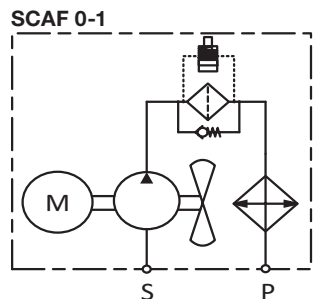
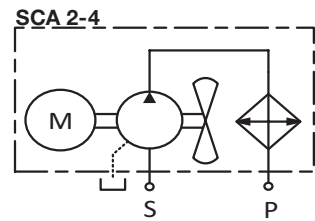
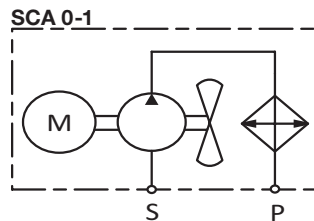
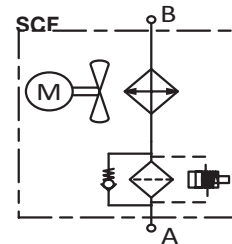
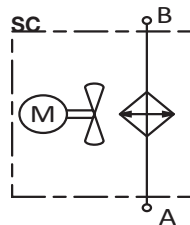


Shipbuilding



Steel / Heavy Industry

## Hydraulic Symbol





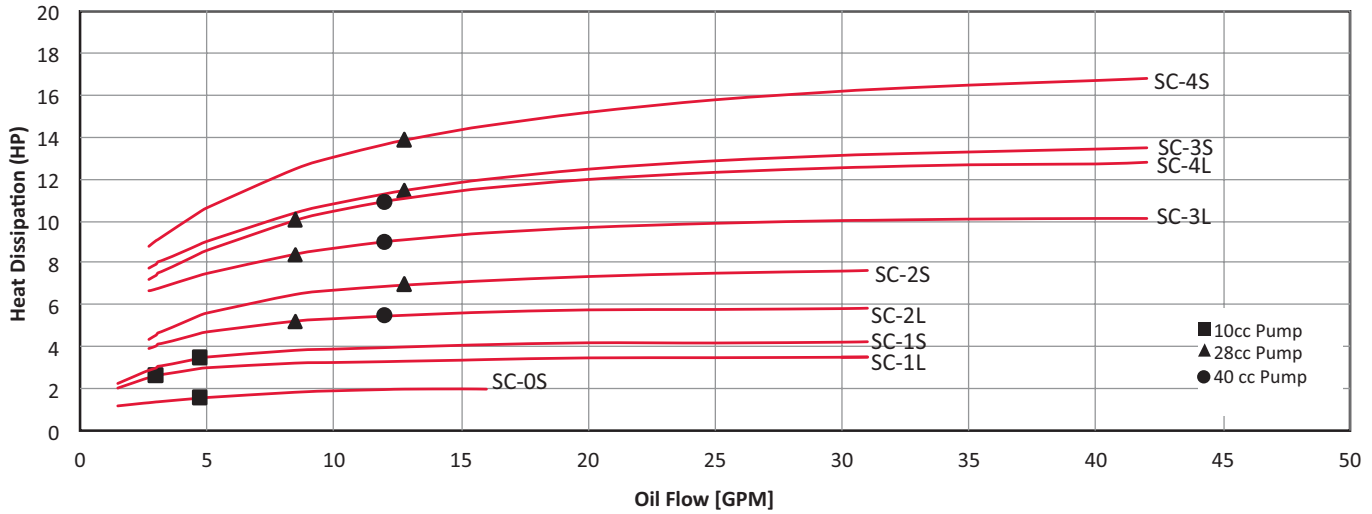


# SC Series

Heat Dissipation @  $\Delta T = 40^{\circ}\text{F}$

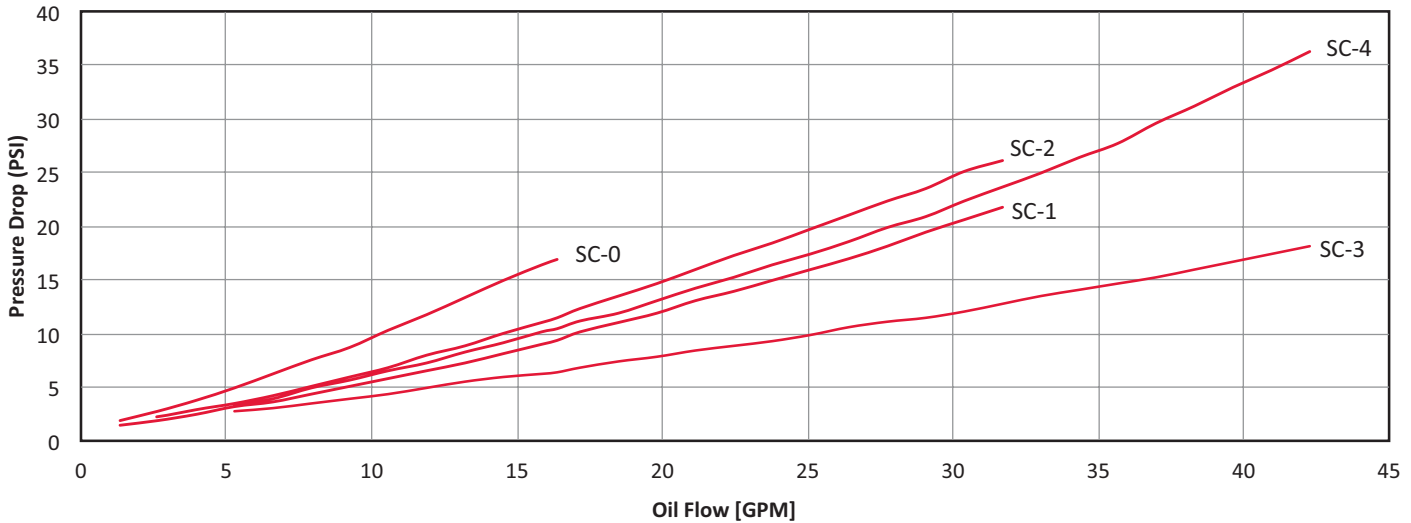
(tolerance  $\pm 5\%$ )

Cooling capacity depending on oil flow and the temperature differential  $\Delta T$  between the oil inlet and air temperature.



Pressure Drop @ 30cSt

(tolerance  $\pm 5\%$ )



- For other viscosities the result must be multiplied by the K factors below

K Factor chart

Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3

## General

Construction	Housing	Welded steel housing, steel filter bracket, steel legs, steel blower wheel
	Heat Exchanger	Aluminum Heavy duty bar and plate
	Motors	TEFC, IEC Frame B5 Flange or NEMA frame style TEFC
Mounting Position		Horizontal, motor shaft
Maximum Pressure	w/o Pump	230 psi (16 BAR) Dynamic 290 psi (20 BAR) Static
	With Pump	90 psi (6 BAR)*
Fluids		Mineral oil to DIN 51524 Part 1 and 2
Contamination Limit		Permissible contamination < NAS 12
Max Viscosity	w/o Pump	2000 cst
	With Pump	180 cst
Ambient Temperature		50°F (10°C) to 104°F (40°C)
Maximum Oil Temperature	w/o Pump	266°F (130°C)
	With Pump	175°F (80°C)
Air Flow Direction		Pulled across Heat Exchanger

## Specifications

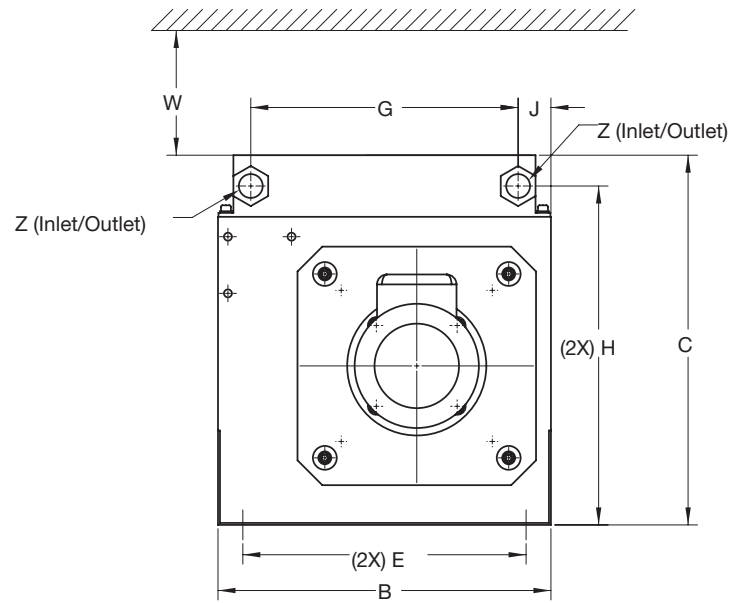
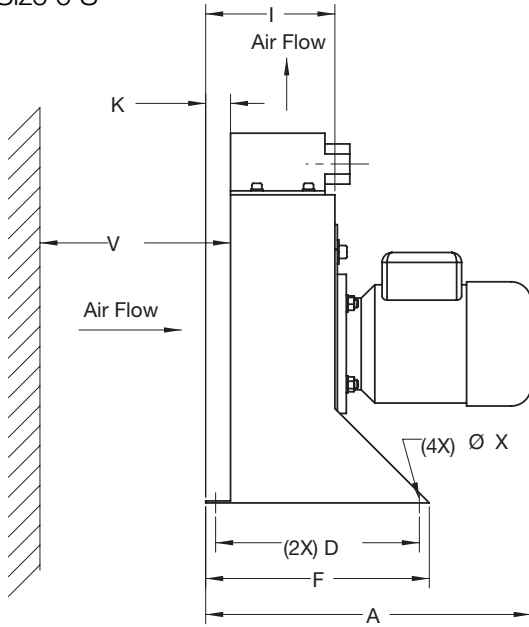
Model	Fluid Specifications				Motor Specifications			
	Description	Maximum Oil Flow Rate (gpm)	Pump Displacement - Flow Rate		Noise (dBa @ 1 meter)	Motor Spec Fan (HP)	Motor Spec Fan/Pump (HP)	Motor Spec (rpm)
SC 0, SCF 0	Fan	16	N/A		68	0.21 (kW)	N/A	1800
SCA 0, SCAF 0	Fan/Pump	N/A	10 cc/rev - 4.75 gpm		70	N/A	0.43 (kW)	1800
SC 1L, SCF 1L	Fan	32	N/A		64	0.29 (kW)	N/A	1200
SCA 1L, SCAF 1L	Fan/Pump	N/A	10 cc/rev - 3.1 gpm		68	N/A	0.29 (kW)	1200
SC 1S, SCF 1S	Fan	32	N/A		69	0.29 (kW)	N/A	1800
SCA 1S, SCAF1S	Fan/Pump	N/A	10 cc/rev - 4.75 gpm		71	N/A	0.43 (kW)	1800
SC 2L, SCF 2L	Fan	32	N/A		66	0.43 (kW)	N/A	1200
SCA 2L, SCAF 2L	Fan/Pump	N/A	28 cc/rev - 8.45 gpm	40 cc/rev - 12 gpm	68	N/A	2.0	1200
SC 2S, SCF2S	Fan	32	N/A		76	0.63 (kW)	N/A	1800
SCA 2S, SCAF2S	Fan/Pump	N/A	28 cc/rev - 12.75 gpm	40cc Not Available	77	N/A	3.0	1800
SC 3L, SCF 3L	Fan	42	N/A		73	1.0	N/A	1200
SCA 3L, SCAF3L	Fan/Pump	N/A	28 cc/rev - 8.45 gpm	40 cc/rev - 12 gpm	73	N/A	2.0	1200
SC 3S, SCF 3S	Fan	42	N/A		82	1.5	N/A	1800
SCA 3S, SCAF3S	Fan/Pump	N/A	28 cc/rev - 12.75 gpm	40cc Not Available	84	N/A	3.0	1800
SC 4L, SCF 4L	Fan	42	N/A		73	1.0	N/A	1200
SCA 4L, SCAF 4L	Fan/Pump	N/A	28 cc/rev - 8.45 gpm	40 cc/rev - 12 gpm	73	N/A	2.0	1200
SC 4S, SCF 4S	Fan	42	N/A		82	1.5	N/A	1800
SCA 4S, SCAF 4S	Fan/Pump	N/A	28 cc/rev - 12.75 gpm	40cc Not Available	84	N/A	3.0	1800

\*The noise levels are only a guide as acoustic properties depend on the characteristics of the room, connections, viscosity and resonance.  
1) 3 Phase Motor

# SC Series

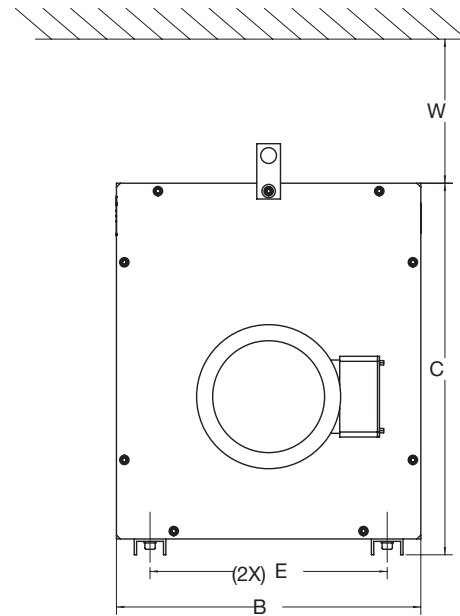
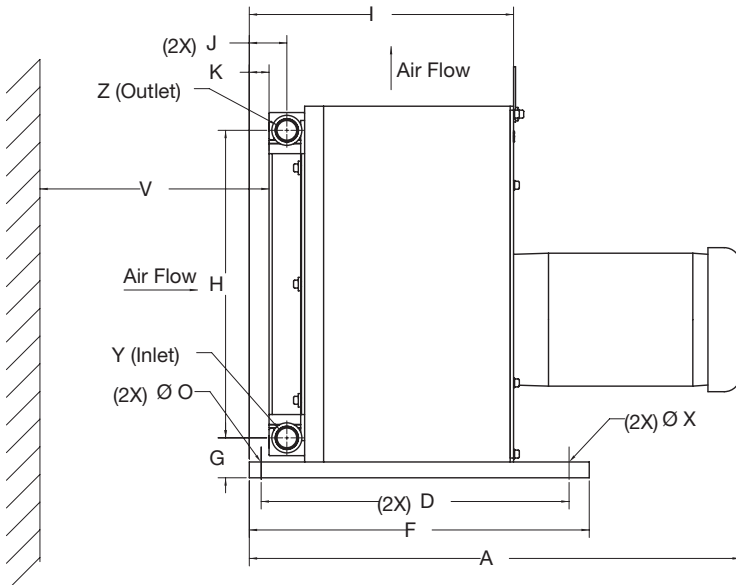
Dimensions

Size 0 S



A	B	C	D	E	F	G	H	I	J	K	V	W	X	Z
12.89	13.19	14.65	8.07	11.22	8.86	10.59	13.43	5.12	1.30	0.98	7.87	31.50	Ø.35	1-1/16"-12 (F)

Sizes 1 - 4 L, S



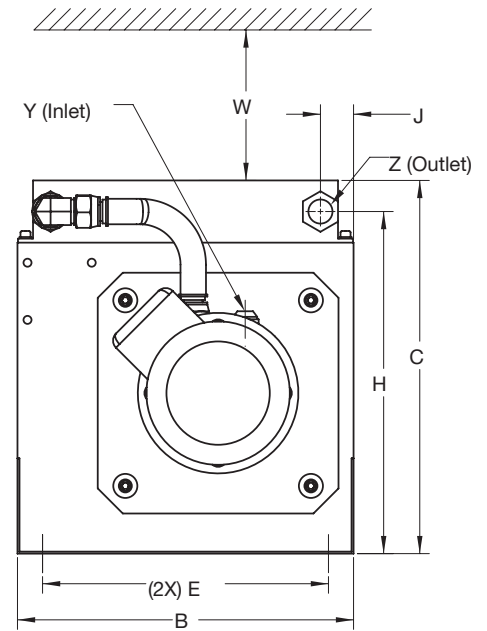
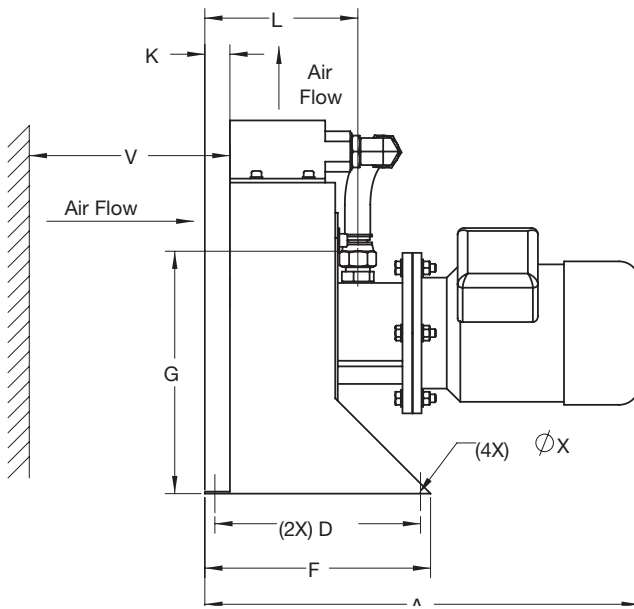
Size	A	B	C	D	E	F	G	H	I	J	K	O	V	W	X	Y	Z
SC1L,S	20.47	13.58	14.76	12.60	11.22	14.17	1.99	11.38	11.57	1.87	0.98	0.35	39.37	11.81	Ø.35x1.2 Slot	1-1/16"-12 (F)	1-1/16"-12 (F)
SC2L,S	24.45	15.16	18.50	15.33	11.81	16.93	1.99	15.31	13.16	1.87	0.98	0.35	59.06	15.75	Ø.35x1.2 Slot	1-1/16"-12 (F)	1-1/16"-12 (F)
SC3L,S	28.39	17.72	20.87	18.50	14.17	19.69	2.23	17.28	17.10	2.46	1.57	0.35	78.74	19.69	Ø.35x1.2 Slot	1-1/16"-12 (F)	1-1/16"-12 (F)
SC4L,S	28.39	17.72	20.87	18.50	14.17	19.69	2.32	17.28	17.10	2.11	1.02	0.35	78.74	19.69	Ø.35x1.2 Slot	1-5/16"-12 (F)	1-5/16"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.  
Dimensions are in inches.

# SCA Series

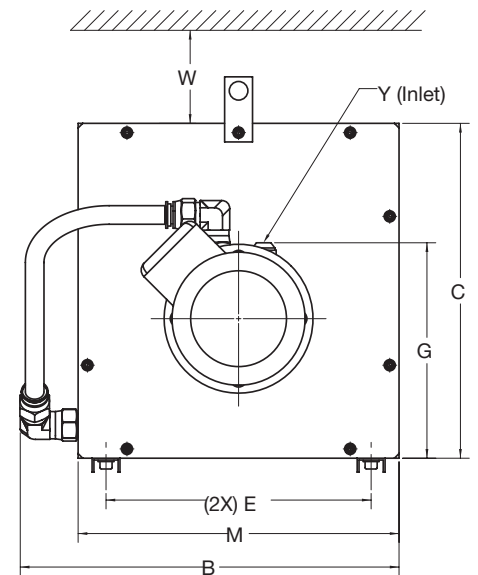
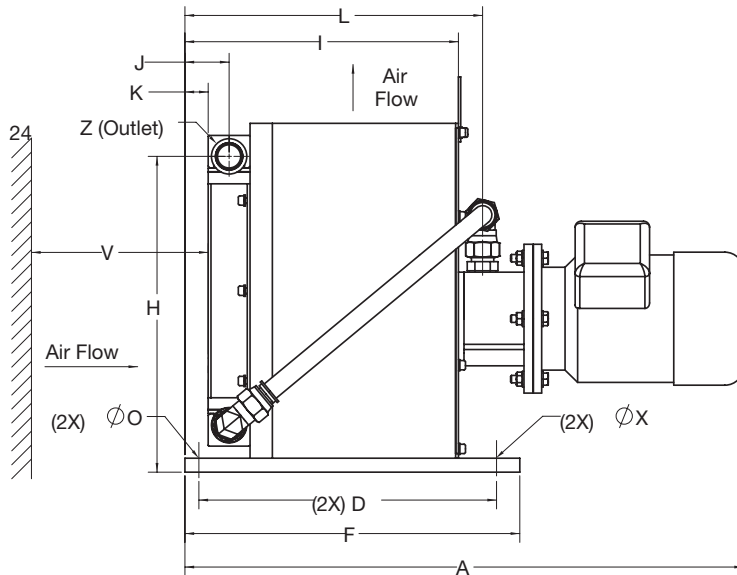
Dimensions

Size 0 S



A	B	C	D	E	F	G	H	J	K	L	V	W	X	Y	Z
17.05	13.19	14.65	8.07	11.22	8.86	9.51	13.43	1.30	0.98	6.00	7.87	31.50	Ø.35	1 1/16"-12 JIC-12 (M)	1-1/16"-12 (F)

Sizes 1L, S



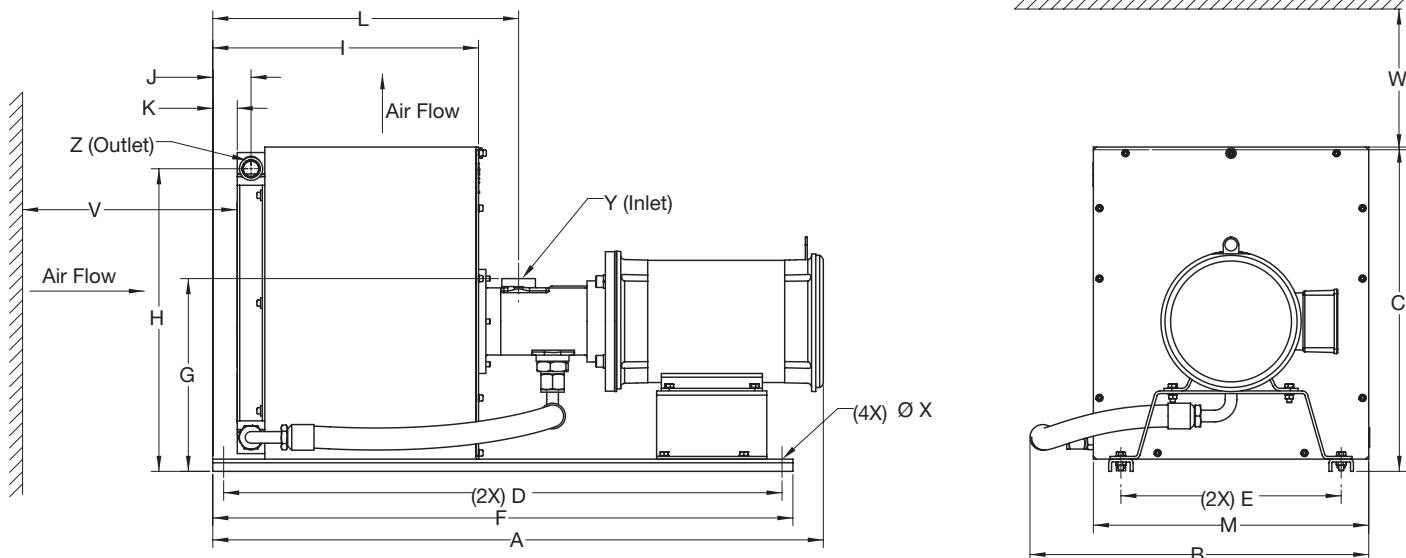
A	B	C	D	E	F	G	H	I	J	K	L	M	O	V	W	X	Y	Z
23.64	16.03	14.76	12.60	11.22	14.17	9.71	13.37	11.57	1.87	0.98	12.60	13.58	Ø.35	11.81	39.37	Ø.35x1.18 slot	1 1/16"-12 JIC-12 (M)	1-1/16"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# SCA Series

Dimensions

Sizes 2 - 4 S

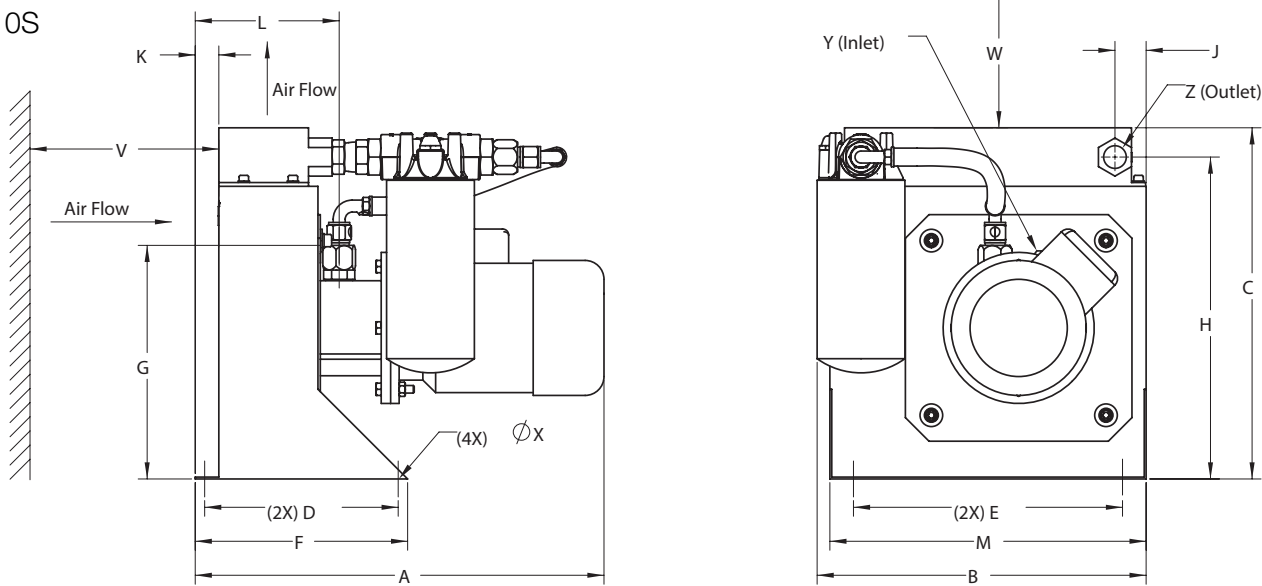


Size	A	B	C	D	E	F	G	H	I	J	K	L	M	V	W	X	Y	Z
SCA2L,SB28	36.76	19.04	18.50	32.31	11.81	33.92	9.84	17.30	14.31	2.99	2.10	16.36	15.16	15.75	59.06	Ø.35x1.18 Slot	1-5/16"-12 (F)	1-1/16"-12 (F)
SCA2LB40	38.27	19.04	18.50	32.31	11.81	33.92	10.63	17.30	14.31	2.99	2.10	16.89	15.16	15.75	59.06	Ø.35x1.18 Slot	1-7/8"-12 (F)	-1/16"-12 (F)
SCA3L,SB28	40.12	21.73	20.87	35.94	14.17	37.92	11.61	19.45	17.69	3.05	2.17	19.74	17.72	19.69	78.74	Ø.35x1.56 Slot	1-5/16"-12 (F)	1-1/16"-12 (F)
SCA3LB40	41.63	21.73	20.87	35.94	14.17	37.92	12.40	19.45	17.69	3.05	2.17	20.27	17.72	19.69	78.74	Ø.35x1.56 Slot	1-7/8"-12 (F)	1-1/16"-12 (F)
SCA4L,SB28	40.12	21.73	20.87	35.94	14.17	37.92	11.61	19.61	17.69	2.70	1.46	19.74	17.72	19.69	78.74	Ø.35x1.56 Slot	1-5/16"-12 (F)	1-5/16"-12 (F)
SCA4LB40	41.63	21.73	20.87	35.94	14.17	37.92	12.40	19.61	17.69	2.70	1.46	20.27	17.72	19.69	78.74	Ø.35x1.56 Slot	1-7/8"-12 (F)	1-5/16"-12 (F)

# SCAF Series

Dimensions

Sizes 0S



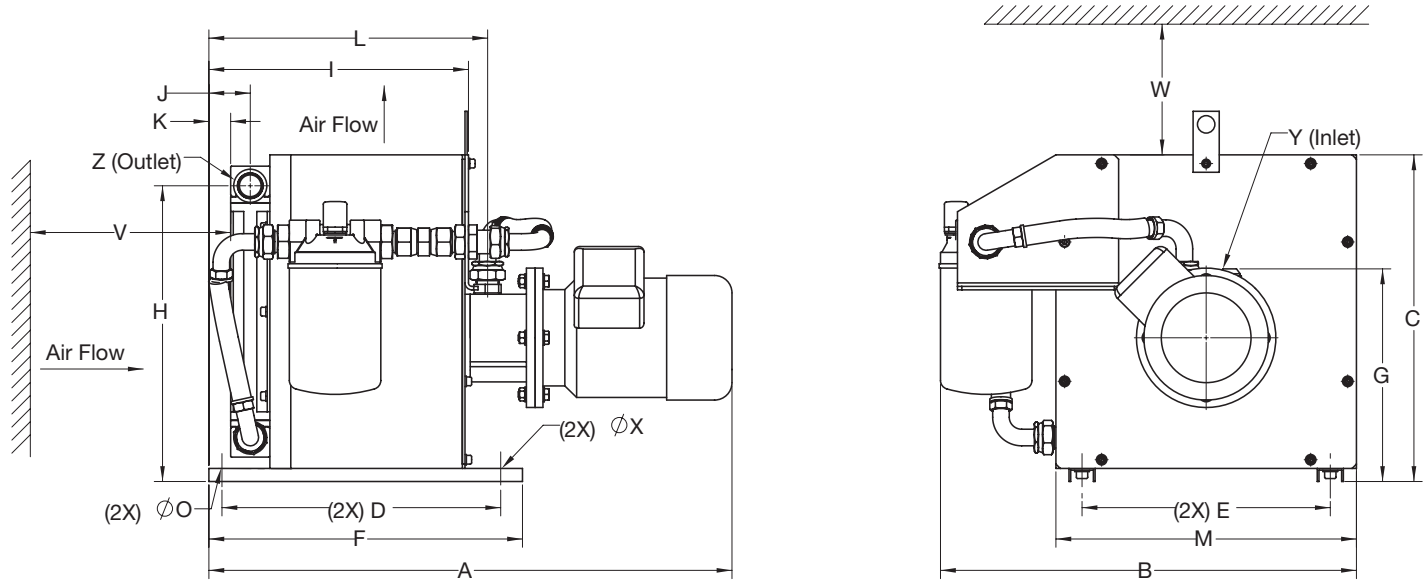
A	B	C	D	E	F	G	H	J	K	L	M	V	W	X	Y	Z
17.05	13.72	14.65	8.07	11.22	8.86	9.51	13.43	1.30	0.98	6.00	13.19	7.87	31.50	Ø.35	1 1/16"-12 JIC-12 (M)	1-1/16"-12 (F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# SCAF Series

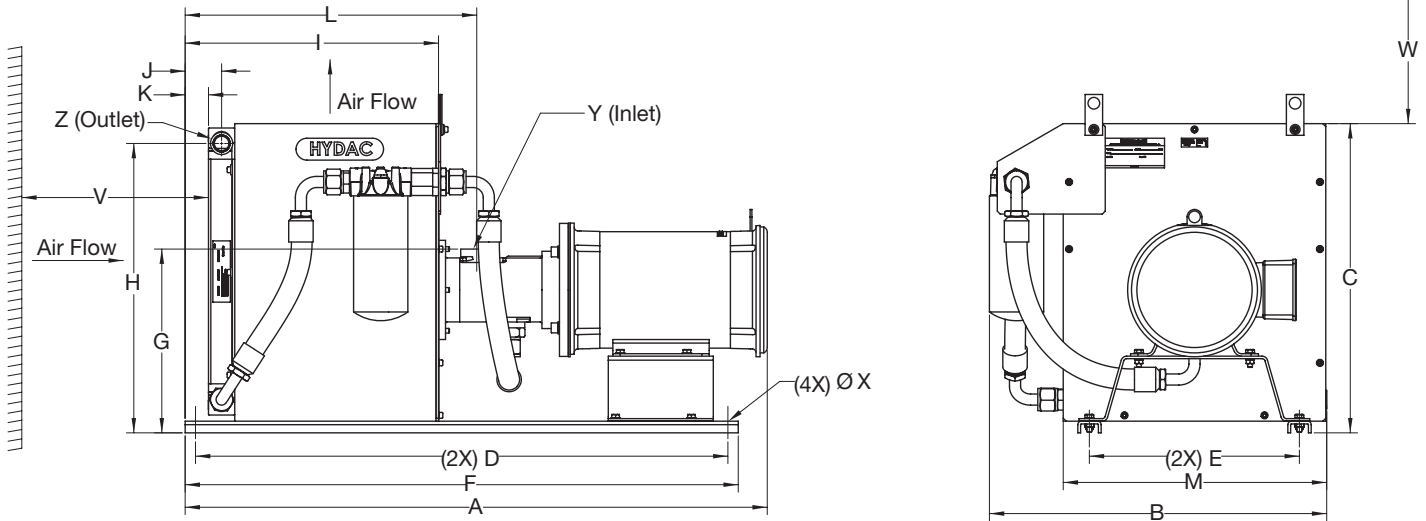
Dimensions

Sizes 1L,S



A	B	C	D	E	F	G	H	I	J	K	L	M	O	V	W	X	Y	Z
23.64	18.80	14.76	12.60	11.22	14.17	9.71	13.37	11.57	1.87	0.98	12.60	13.58	Ø.35	11.81	39.37	Ø.35x1.18 slot	1 1/16"-12 JIC-12 (M)	1-1/16"-12 (F)

Sizes 2 - 4S

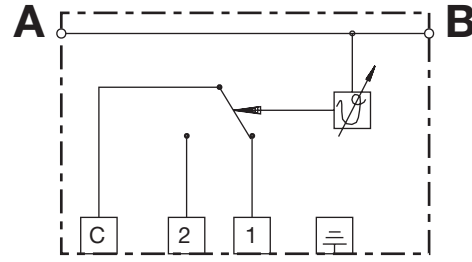
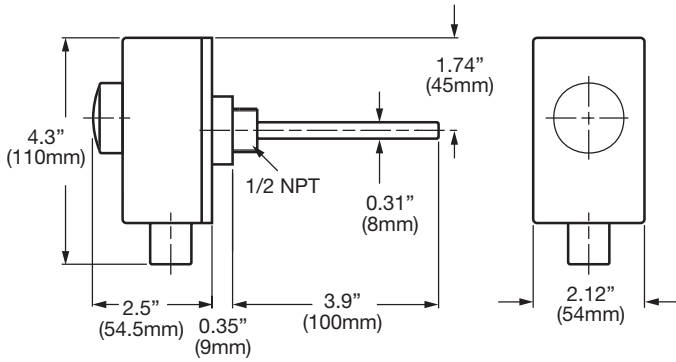


Size	A	B	C	D	E	F	G	H	I	J	K	L	M	V	W	X	Y	Z
SCAF2L, SB28	36.76	20.14	18.50	32.31	11.81	33.92	9.84	17.30	14.31	2.99	2.10	16.36	15.16	15.75	59.06	Ø.35x1.18 Slot	1-5/16"-12(F)	1-1/16"-12 (F)
SCAF2LB40	38.27	20.14	18.50	32.31	11.81	33.92	10.63	17.30	14.31	2.99	2.10	16.89	15.16	15.75	59.06	Ø.35x1.18 Slot	1-7/8"-12(F)	1-1/16"-12 (F)
SCAF3L, SB28	40.12	23.37	20.87	35.94	14.17	37.92	11.61	19.45	17.69	3.05	2.17	19.74	17.72	19.69	78.70	Ø.35x1.56 Slot	1-5/16"-12(F)	1-1/16"-12 (F)
SCAF3LB40	41.63	23.37	20.87	35.94	14.17	37.92	12.40	19.45	17.69	3.05	2.17	20.27	17.72	19.69	78.70	Ø.35x1.56 Slot	1-7/8"-12(F)	1-1/16"-12 (F)
SCAF4L, SB28	40.12	23.37	20.87	35.94	14.17	37.92	11.61	19.61	17.69	2.70	1.46	19.74	17.72	19.69	78.70	Ø.35x1.56 Slot	1-5/16"-12(F)	1-5/16"-12(F)
SCAF4LB40	41.63	23.37	20.87	35.94	14.17	37.92	12.40	19.61	17.69	2.70	1.46	20.27	17.72	19.69	78.70	Ø.35x1.56 Slot	1-7/8"-12(F)	1-5/16"-12(F)

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# TR1 Series

Adjustable Temperature Switch  
Tank Mounted

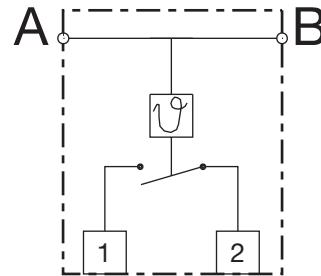
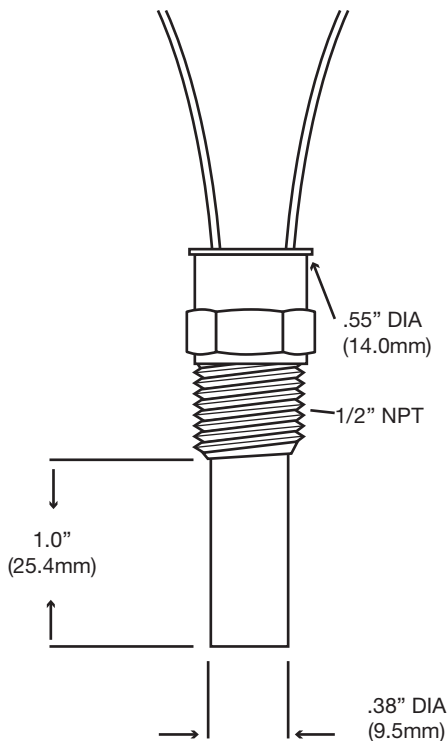


## TR1/AITR Adjustable Thermostat

Temperature Range	0 to 200° F (0 to 95° C)
Switching Differential	5°F (2.5° C)
Voltage	220V/440V
Amps	10A/220V 5A/440V
Enclosure	IP50
Conduit Connector	1/2"
Max. psi	150

# TS Series

Hydraulic Symbol



## TS Technical Data

Voltage	12/24 VDC 120/220/440V
Amps	6A / 120V, 3A / 240V, 4A / 12VDC, 2A / 24VDC
Accuracy	±3%

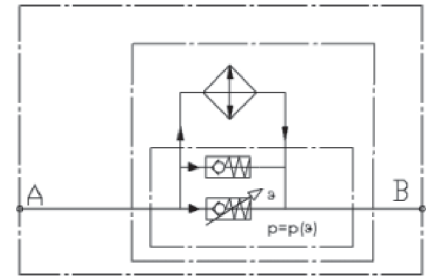
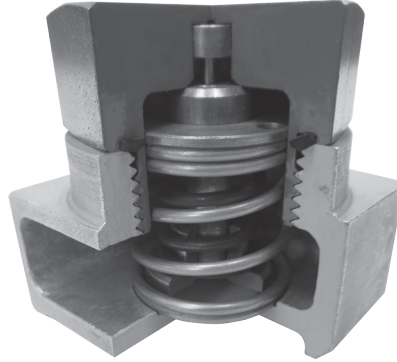
For more information, please visit us at [www.hydacusa.com](http://www.hydacusa.com)



# Bypass

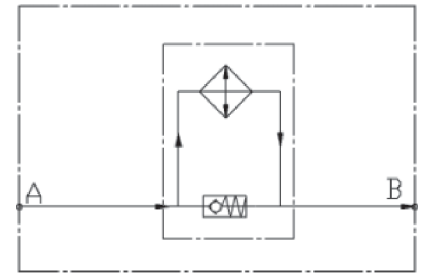
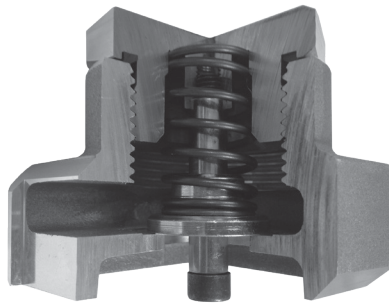
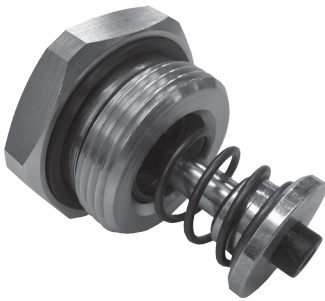
IBT Thermostatic Bypass

Hydraulic Symbol



IBP Integrated Bypass

Hydraulic Symbol



Model Code

**IBT 45 / 3**

**Model**

- IBT = thermostatic bypass valve
- IBP = integrated bypass valve

**Opening Temperature (IBT only)**

	<b>Opening Temp.</b>	<b>Closing Temp.</b>
45	= 113°F (45°C)	131°F (55°C)
50	= 130°F (55°C)	150°F (65°C)
60	= 140°F (60°C)	158°F (70°C)

**Opening Pressure Drop**

- 2 = 2 bar (29 psi)
- 3 = 3 bar (45 psi)
- 4 = 4 bar (58 psi) IBP only



**Features**

- Fixed setting temperature valve
- Precise Temperature control
- Low pressure drop
- Shock resistant
- Can function in any position
- Maximum pressure 230 psi (16 bar)
- Maintenance-free

**Warning:**

These valves are added to a bypass version cooling element in conjunction with a flow channel that is brazed into the original construction.

# HEX Series

## Plate Heat Exchangers



### Description

Heat exchangers are used to exchange heat between two fluids. Plate heat exchangers are high performance components and provide a high level of efficiency combined with compact dimensions and low weight. Their efficiency reduces the amount of cooling water required for heat transfer which results in low operating costs.

### Features

Plates and connections are manufactured from stainless steel to AISI 316, 1.4401, vacuum-brazed with copper. The special molding of the plates produces the turbulent flow necessary for effective heat transfer and provides the plate heat exchanger with a high level of mechanical strength. Nickel brazed option available.

### Operating Details

#### Medium:

- Water glycol (coolants)
- HFC operating fluids
- Water
- Oil

#### Contamination:

The quantity of particles in suspension should be less than 10 mg/l. Particle size < 0.6 mm (spherical).

Thread-like particles cause a rapid rise in pressure drops.

#### Temperature Range:

- 50° to 437°F (10° to 225°C)  
(freezing point and boiling point must be taken into consideration!)

#### Pressure:

- max. 435 psi (30bar) (static)
- Test pressure: 650 psi

#### Corrosion:

The following limits refer to a pH value of 7

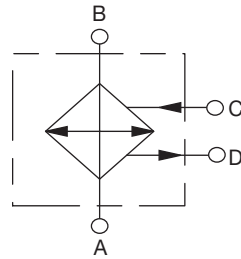
- free chlorine, CL2 < 0.5 ppm
- chloride ions CL  
< 700 ppm at 20 °C  
< 200 ppm at 50 °C

#### Other Limits:

- ph 7 – 10
- sulphate SO4 2- <100 ppm
- [H CO3 -] / [SO4 2- ] >1
- ammonia, NH3 <10 ppm
- free CO < 10 ppm

The following ions are not corrosive under normal conditions: phosphate, nitrate, nitrite, iron, manganese, sodium and potassium

### Hydraulic Symbol



AIB cooler element bypass option for high viscosity applications.

### Applications

Model Code

HEX 610 - 10 NPT

Series

- HEX 610
- HEX 615
- HEX 422

Number of Plates

	10	20	30	40	50	60	70	80	100	120	150
610	x	x	x	x	x	x	x	x	x	x	x
615	x	x	x	x	x	x	x	x	x	x	
422		x	x	x	x	x	x	x	x	x	x

other number of plates available - consult factory.

Port Type

- NPT = 610 + 615 series w/ 1" NPT; 422 series w/ 1-1/2" NPT
- G = 610 + 615 series w/ G1" ; 422 series w/ G1-1/2"

other port types available - consult factory.

*Mounting brackets must be ordered separately.*

*Note: Pipes must be connected so that connections are stress free. Linear expansion and vibrations from the pipes to the heat exchanger must be avoided.*

Pressure drop across heat exchanger

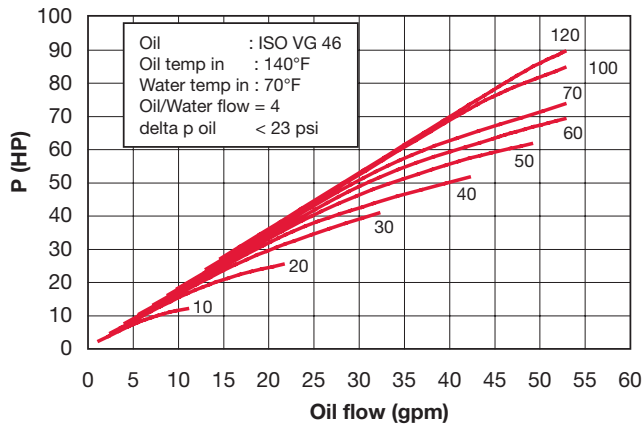
This table is based on an ISO VG45 oil at 130°F and shows the pump flows with the 1,800 RPM motors. If other grades of oil are to be used, consult the sizing software. When using the 72 psi clogging indicator the pressure drop should not exceed 15 psi max across the heat exchanger. When using the 29 psi clogging indicator the pressure drop should not exceed 30 psi max across the heat exchanger.

Heat Exchanger Size	Pump 3.5 1.6 gpm (6.3 l/min)	Pump 7 3.3 gpm (12.6 l/min)	Pump 10 4.75 gpm (18 l/min)	Pump 15 7 gpm (18 l/min)	Pump 20 9.5 gpm (18 l/min)	Pump 30 14.5 gpm (55 l/min)	Pump 40 18.5 gpm (70 l/min)	Pump 50 23.5 gpm (90 l/min)	Pump 70 34 gpm (130 l/min)	Pump 100 47.5 gpm (180 l/min)
610-10	3	5	8	-	-	-	-	-	-	-
610-20	1	2	3	5	7	13.66	-	-	-	-
610-40	-	-	-	2	3	7.35	9.85	13.4	-	-
610-50	-	-	-	-	-	5.64	7.54	10.27	16.19	-
610-70	-	-	-	-	-	4.1	5.2	7	11.1	16.8
610-100	-	-	-	-	-	3	3.8	4.9	7.6	11.66
610-120	-	-	-	-	-	2.55	3.25	4.2	6.35	9.8
615-10	4	9	15	-	-	-	-	-	-	-
615-20	2	3.3	5	9	13	-	-	-	-	-
615-40	-	-	-	4	5	13.25	17.8	-	-	-
615-60	-	-	-	-	-	8.15	10.8	14.75	-	-
615-80	-	-	-	-	-	5.95	7.75	10.5	16.6	-

# HEX Series

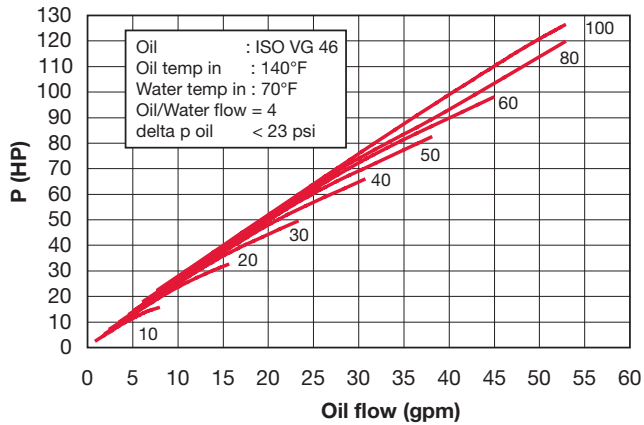
## Technical Data

### Size 610



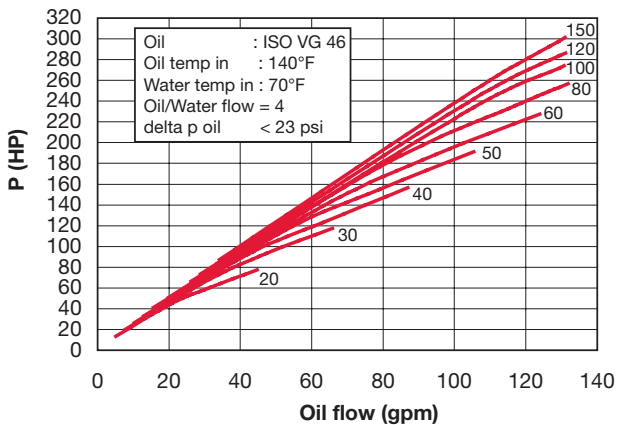
Number of plates (N)	H = 10 + Nx2.4 (mm)	lbs
10	34	5.5
20	58	8.4
30	82	11.2
40	106	14.0
50	130	17.0
60	154	19.8
70	178	22.6
100	250	31.2
120	298	37.0

### Size 615



Number of plates (N)	H = 10 + Nx2.4 (mm)	lbs
10	34	9.2
20	58	14.3
30	82	19.4
40	106	24.4
50	130	29.7
60	154	35.5
80	202	44.6

### Size 422



Number of plates (N)	H = 10 + Nx2.85 (mm)	lbs
20	67	34.7
30	95.5	44.5
40	124	54.1
50	152.5	63.8
60	181	73.5
80	238	92.8
100	295	112.2

The cooling capacity is also dependent on the viscosity class. At a lower viscosity class the cooling capacity increases, at a higher viscosity class it decreases. In order to make an accurate calculation, the following details are required:

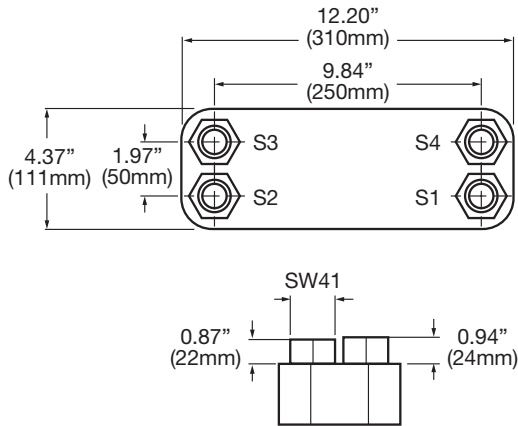
- type of oil
- permissible tank temperature
- required outlet temperature of the oil or necessary cooling capacity
- inlet temperature of the water and maximum water quantity.

#### Selection Program

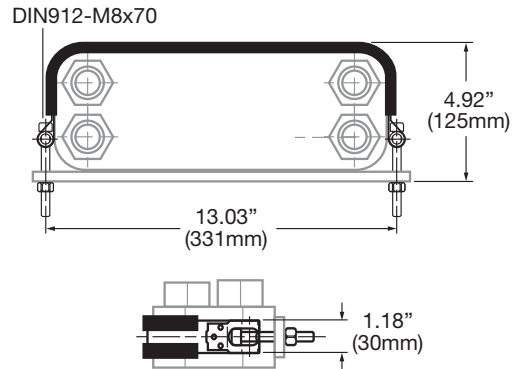
The cooler selection program calculates the correct heat exchanger in the case of non-standard operating data.

Please contact our technical sales department.

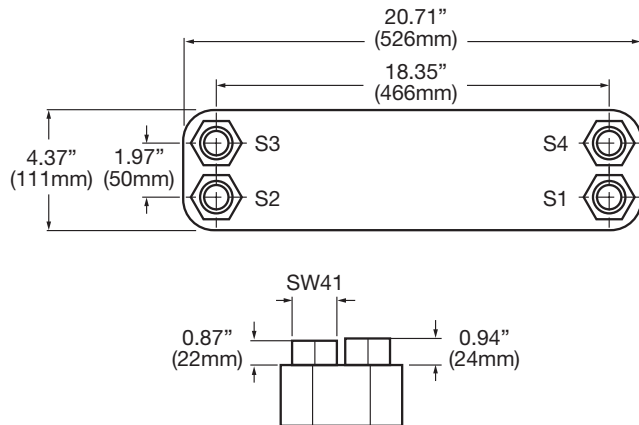
Dimensions  
Size 610



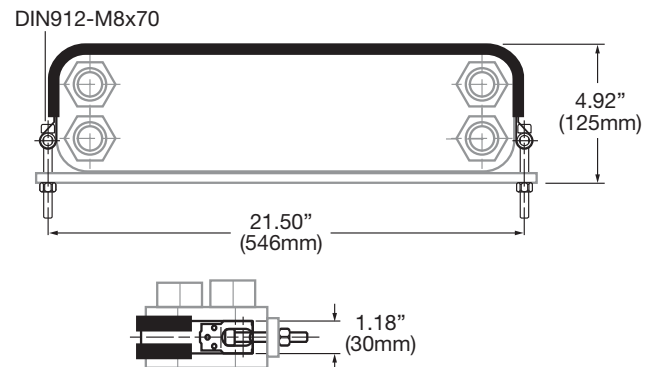
Mounting Bracket  
610 Mounting Bracket (PN# 268524)



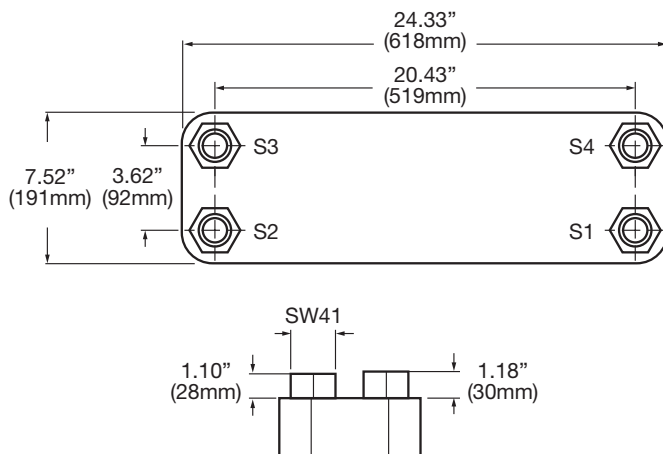
Size 615



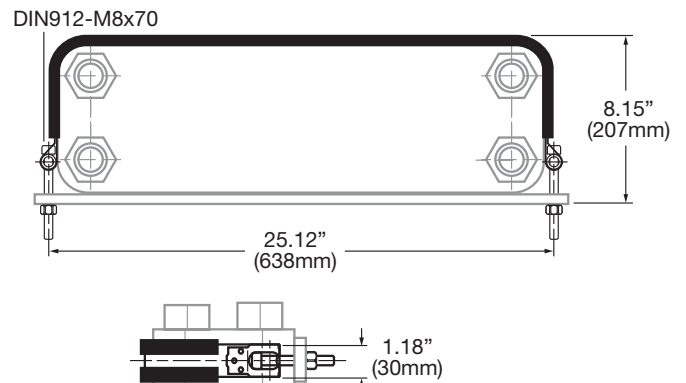
Mounting Bracket  
615 Mounting Bracket (PN# 3014029)



Size 422



Mounting Bracket  
422 Mounting Bracket (PN# 3013884)



Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.  
Dimensions are in inches/(mm).

Please note: For mounting heat exchangers with 60 plates and above, two clamps are recommended.

# H Series

## Gasketed Plate Heat Exchanger



### Description

Heat exchangers are used to transfer heat between two media. Gasketed plate heat exchangers are high performance components and provide a high level of efficiency combined with compact dimensions. They also have a high degree of flexibility. For higher capacity ranges this series is a useful supplement to the brazed version.

### Features

The gasketed plate heat exchanger consists of a pack of individual, embossed heat transfer plates made of stainless steel 1.4401 (AISI 316), 1.4306 (AISI 304). The plates are sealed and the media kept separate by using gaskets in nitrile rubber (NBR) or optionally FKM (Viton) or EPDM.

The plate pack is installed in a frame which consists of a fixed plate and a pressure plate, tightening bolts and supports. There are several sizes with different numbers of plates available to cover the capacity range.

The heat exchanger is connected inline via threaded or flange connections. Depending on the application, special models are available with higher grade materials (Titanium). For such applications, please contact the relevant department.

### Operating Details

#### Fluids:

- Water glycol (*coolants*)
- HFC operating fluids
- Water
- Oil

#### Contamination:

The quantity of particles in suspension should be less than 10 mg/l. Particle size < 0.6 mm (*spherical*).

Thread-like particles cause a rapid rise in pressure drops.

#### Temperature Range:

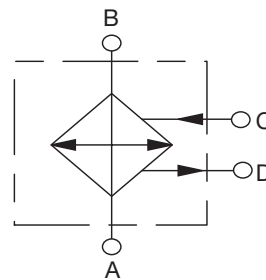
- max. 284°F (140°C)

#### Pressure:

- max. 145 psi (10 bar)
- max. 232 psi (16 bar)
- max. 363 psi (25 bar)

Note: Pressure surges must be avoided.

### Hydraulic Symbol



### Applications

For cooling circuits in reverse flow which can be operated using water, coolants, HFC operating fluids or oils. For applications using other media, please contact the relevant department.

Typical applications are:

- Hydraulic systems
- Presses
- Lubrication systems
- Test rigs
- Motors

## Model Code

	<b>H38</b>	<b>- IG</b>	<b>10</b>	<b>- 12</b>	<b>- TKTM</b>	<b>33</b>	<b>- LIQUID</b>
<b>Series</b>	H2, H8, H14, H16, H18, H28, H38, H40, H42, H44, H62, H82, H84, H94, H128, H128, H172, H220						
<b>Carbon Steel Frame Type</b>	IG = For sizes H8A,H16A,H18A,H38A,H62A,H42A,H44,H94 and H128 IS = For sizes H42,H94,H128 (ASME and length above 1300 mm), H82, H46, H162 ST = For sizes H14A,H28A,H40A						
<b>Working Pressure</b>	10 = 150 psi 16 = 232 psi 25 = 362 psi						
<b>Number of Plates</b>	XX = Number of plates						
<b>Plate Design</b>	TMTL = Plate configuration TL = Thermal long TK = Thermal short TM = Thermal mix i.e TL + TK TMTL = Thermal long + Thermal mix TKTM = Thermal mix + thermal short TX = Thermal long + Thermal X XX % of last plate configuration (example: TMTL80 = 80% Thermal long + 20% Thermal Mix)						
<b>Thermal Length</b>							
<b>Liquid</b>							

*Consult factory for sizing.*

## Corrosion Limits

Water Ingredient	Concentration of Ingredient in mg/l	Advice 1.4401
Aluminium (Al) – in Solution	< 0.2 / > 0.2	A / A
Ammonia (NH3)	< 2 / 2 – 20 / > 20	A / A / A
Chlorides (Cl)- (max. 60°C)	< 250 / > 250	A / B
Electric Conductivity	< 10 µ S/cm / 10 – 500 µ S/cm / > 500 µ S/cm	A / A / A
Iron (Fe) – in Solution	< 0.2 / > 0.2	A / A
Free Aggressive Carbonic Acid (CO2)	< 5 / 5 – 20 / > 20	A / A / A
Total Hardness	4.0 – 8.5°dH	A
Glycol Content	< 20% / 20 – 50 / > 50%	A / A / A
HCO3 SO4-2	< 1.0 / > 1.0	A / A
Hydrocarbonate HCO3	< 70 / 70 – 300 / > 300	A / A / A
Manganese (Mn) – in Solution	< 0.1 / > 0.1	A / A
Nitrate – in Solution NO3	< 100 / > 100	A / A
pH-Value	< 6 / 6.0 – 7.5 / 7.5 – 9.0 / > 9	B / A/B / A / A
Sulfate SO42-	< 70 / 70 – 300 / > 300	A / A / C
Sulfite So3 / Freies Chlorgas Cl2	< 1 / 1 – 5 / > 5	A / A / A/B
Hydrosulfide H2S	< 0.05 / > 0.05	A / A

A = Under normal conditions good consistency  
 B = Subject to corrosion, especially if several substances with B  
 C = Unsuitable

## Other Limits

Chloride Content	max. Temperature of Wall Surface			
	140°F (60°C)	176°F (80°C)	248°F (120°C)	266°F (130°C)
≤ 10 ppm	304 SS	304 SS	304 SS	316 SS
≤ 25 ppm	304 SS	304 SS	316 SS	316 SS
≤ 50 ppm	304 SS	316 SS	316 SS	Titan
≤ 80 ppm	316 SS	316 SS	316 SS	Titan
≤ 150 ppm	316 SS	316 SS	Titan	Titan
≤ 300 ppm	316 SS	Titan	Titan	Titan
> 300 ppm	Titan	Titan	Titan	Titan

# Gasketed Plate Heat Exchanger

Technical Data Inquiry Sheet

## Internal Use Only

Project Responsibility \_\_\_\_\_

Date \_\_\_\_\_

## Customer Information

Name _____	Title _____
Company _____	E-mail _____
Address _____	State _____ Zip _____
Phone _____	Fax _____

## Application

--

## Sizing Data

	Unit of Measurement	Hot Side	Cold Side
Power Dissipation _____	_____	_____	_____
Fluid _____	_____	_____	_____
State of Aggregation _____	_____	_____	_____
Flow Rate _____	_____	_____	_____
Inlet Temperature _____	_____	_____	_____
Outlet Temperature _____	_____	_____	_____
Permissible Pressure Drop _____	_____	_____	_____
Density _____	_____	_____	_____
Specific Heat Capacity _____	_____	_____	_____
Thermal Conductivity _____	_____	_____	_____
Viscosity _____	_____	_____	_____
Operating Pressure _____	_____	_____	_____
Design Pressure _____	_____	_____	_____
Test Pressure _____	_____	_____	_____
Design Temperature _____	_____	_____	_____

## Design

Type of Construction _____
Material _____
Plates _____
Gaskets _____

## Miscellaneous

--



# OKC / OK / ELD / ELH Series

## Crossovers

HYDAC	Thermal Transfer	AKG	Oil Air	American Industrial	Hayden
OKC-1H	AO5	-	-	-	108-028510
OKC-2H	AO10, AO15, AOVH5, AOC-19, AOC-22	-	OAI 04	AC5, AC10, AC15	108-028514
OKC-3H	AO20, AOVH10, AOC-24, BOL-8	AC8	OAI07-4, OAI07-2	AOCH5	-
OKC-4S	AO25, AOVH15, AOC-33, BOL-16	-	OAI11-4	AC 20, AOCH10	208-028518, 208-028522
OKC-5S	AO30, AOVH20, AOC-37	AC16	OAI11-2, OAI16-6, OAI16-4	AC25, AOCH15, AOCH20	213-028538
OKC-6H	AOVH25, AOC-50	AC30	OAI23-6, OAI23-4	AC30	113-028526, 113-028530, 213-028534
OKC-6S	AO35	-	-	-	-
OKC-7S	BOL-30, APC-54, BOL-400, AO40	-	-	AC35, AOCH25	-
OK-1H	-	-	-	-	108-028510
OK-2S	AO5, AO10, AOC-19, AOC-22	-	-	AC5, AC10	108-028514
OK-2H	-	AC8	OAI-04, OAI07-4	AC15, AOCH5	-
OK-3S	BOL-8	-	OAI07-2	-	-
OK-3H	AO20	-	OAI11-4	AC20	208-028518, 208-028522
OK-4L	AOVH15, AOC33	-	-	AOCH10	-
OK-4S	AOVH20, AOC-37	-	OAI11-2	AC25	-
OK-5L	AO25, BOL-16	-	-	-	-
OK-5S	-	-	OAI23-6, OAI16-4	-	-
OK-6L	AO30, AOC-50	AC16	OAI-16-4	AOCH15	113-028530
OK-6S	AO35, AOVH25	AC30	-	AC30, AOCH20	113-028526, 213-028534
OK-7L	AO40	-	-	-	213-028534
OK-7S	-	-	-	-	313-028542, 313-028546
OK-8L	AOVH30, AOC-54, BOL-30, BOL-400	-	-	AC35, AOCH25	-
OK-8S	AOC-57, BOL-725	AC40	OAI33-6, OAI33-4, OAI44-6	AC40	318-028926
OK-9L	AOVH35	-	-	-	318-028926
OK-10L	AOC-70, BOL-950	AC10	OAI44-4, QAI56-6	AOCH35	-
OK-11L	AOVH40, BOL-1200, BOL-1600	AC100	OAI56-4, OAI76-8, OAI76-6	AOCH40	-
ELD-1H	AOC-19	-	-	AOMF-1, LP15	-
ELD-1.5H	DF-11	DC-10	OATBD04	EOC-220	-
ELD-2H	AOC-22, AOC-24, DF-12, MA-12	DC-16	OATBD07	AOMF-2, AOMF-4, LP-30, LP-60, EOC-249	-
ELD-3H	AOC-33	DC-20	-	EOC-337	-
ELD-4H	AOC-37, DF-22, MA-32	-	OATBD11, OATBD16	EOC-375, EOC-505	-
ELD-4.5H	AOC-50	-	-	EOC-545	-
ELD-5H	AOC-54	-	OATBD23	-	-
ELD-6H	AOC-57	-	-	-	-
ELH-2	AOC-70, DF-11, DF12	HC-14	-	-	-
ELH-3	AOC-22, AOC-24	HC-26	OAH007	-	-
ELH-4	AOC-33, DF-22	HC-32	OAH011, OAH016	-	-
ELH-5	AOC-37	-	OAH023	-	-
ELH-6	AOC-50	-	-	-	-
ELH-7	-	HC-48	OAH033, OAH094	-	-
ELH-8	AOC-54	-	OAH056	-	-
ELH-9	AOC-57	HC-120	OAH058, OAH076	-	-
ELH-10	AOC-70	-	OAH028, OAH110	-	-
ELH-11	-	HC-180	OAH112	-	-



Every effort has been made to insure the accuracy of the cooler data and cross reference information. However, due to manufacturer design changes, HYDAC cannot accept responsibility for selection or misapplication of the product. Please contact HYDAC for additional information.





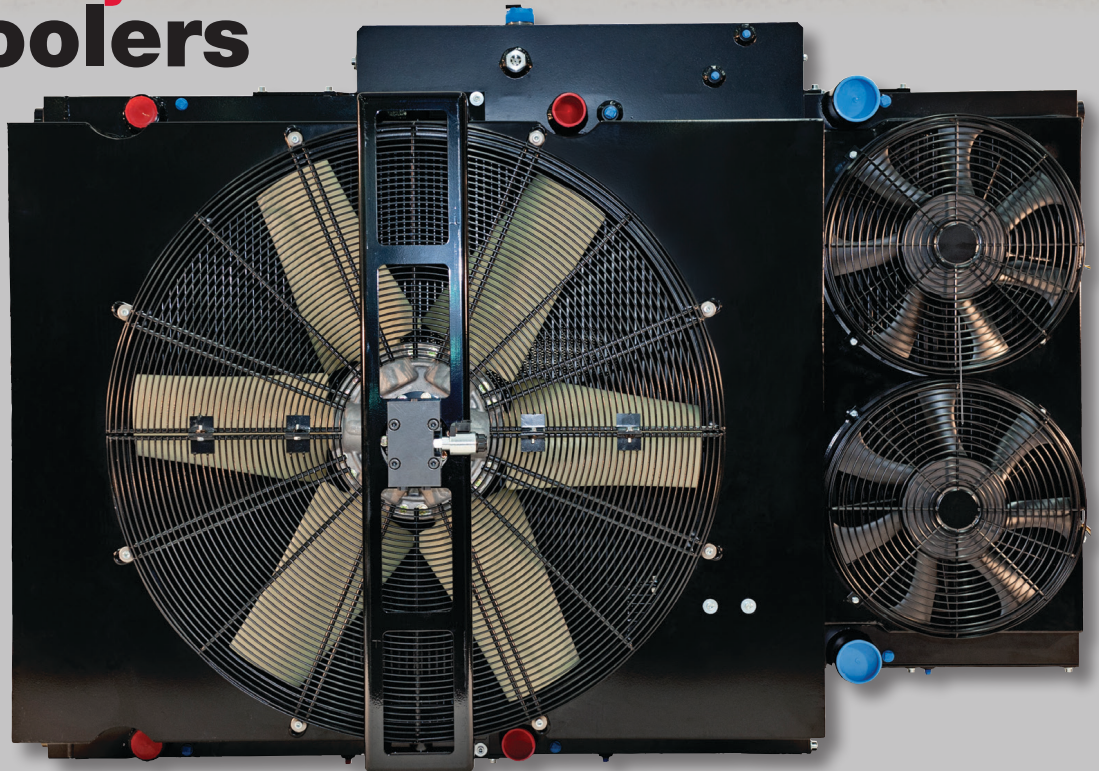
360° of

**HYDAC**

## Value and Versatility! Combi-Coolers

### Advantages of the HYDAC Combi-Cooler

- Cooling of multiple fluids:  
Engine coolant, intake charge air,  
hydraulic fluid, transmission fluid,  
fuel, and more
- Integration potential:
  - Fan shrouds: steel, plastic, or  
fiberglass reinforced
  - Coolant expansion tanks
  - Hydraulic, AC and/or DC brushless  
fan drives with electronic fan drive  
controllers
  - Other hydraulic components, filters,  
oil reservoirs, etc.
- Robust bar and plate heat  
exchanger design
- Minimal capital tooling investment
- Production project annual volumes  
feasible from 100 to 10,000 pcs.



## Global Presence. Local Expertise.

HYDAC is a leading manufacturer worldwide of components and systems required in hydraulic and lubrication technology. The crucial advantage for the customer is one stop supply—from high-quality components to subsystems, right up to turnkey complete systems.



360° of

**HYDAC**

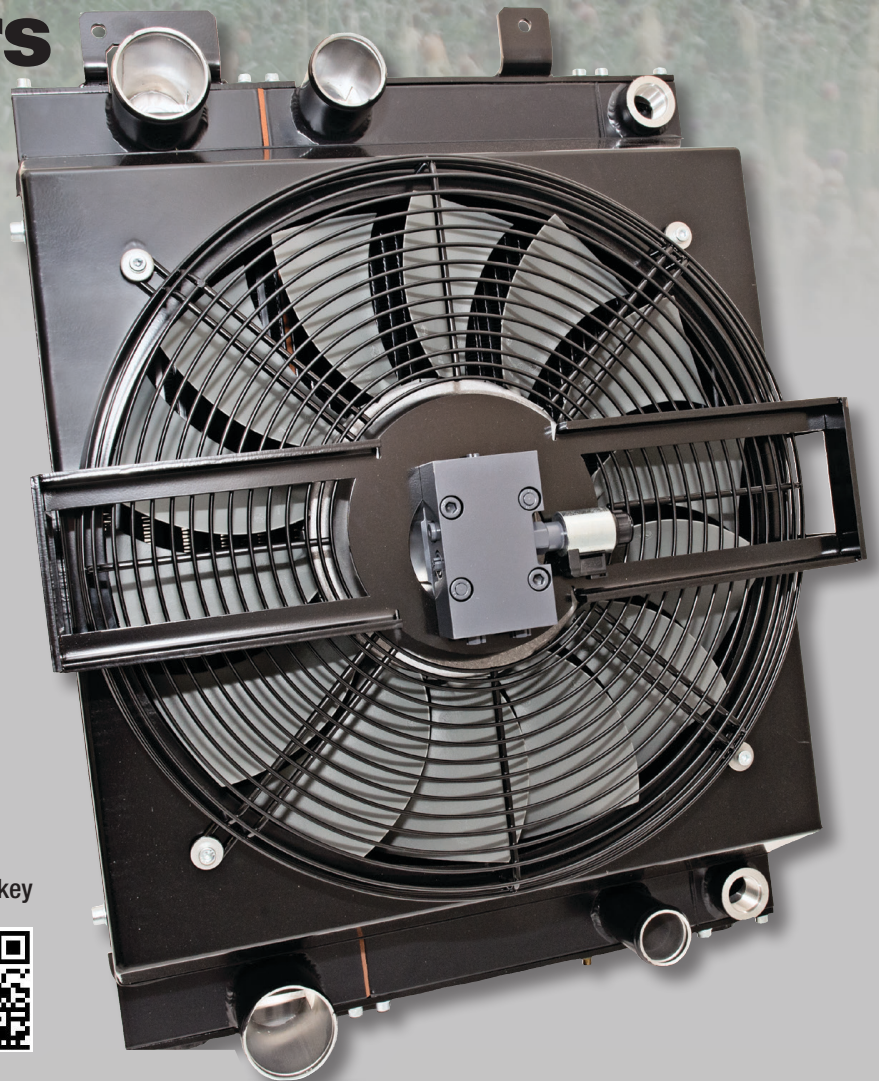
## Value and Versatility! Combi-Coolers

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  - Fan shrouds: steel, plastic, or fiberglass reinforced
  - Coolant expansion tanks
  - Hydraulic, AC and/or DC brushless fan drives with electronic fan drive controllers
  - Other hydraulic components, filters, oil reservoirs, etc.
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# HYDAC the Reliable Partner for Wind Turbines

With 7,000 employees HYDAC is one of the leading manufacturers of fluid technology, hydraulics and electronics worldwide.

We help our customers develop wind energy systems from concept to completion. Our knowledge and application experience is your asset. HYDAC products and solutions can be found in thousands of wind energy systems worldwide:

HYDAC offers complete systems and filtration concepts for lubrication and hydraulics as well as cooling systems for gear drives and generators.

HYDAC is a leading supplier to the wind industry and has tens of thousands of coolers installed in many major OEM applications. From innovative designs with built in pressure and thermal bypasses and all climate/altitude conditions and ranging applications from gearbox, inverter/electronics and generator cooling HYDAC has the systems to meet your wind turbine cooling needs.

## Global yet local.

With 50+ subsidiaries, more than 500 Distributors and service centers HYDAC is a reliable partner, worldwide.

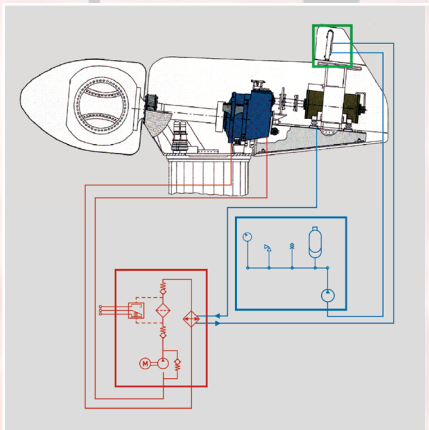
## Solution packages.

**One supplier.**

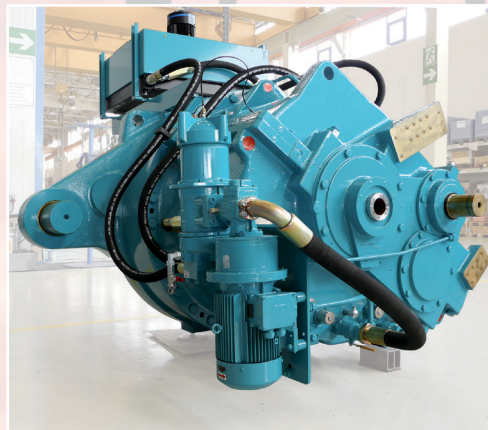
**One contact.**

Wherever you need us, we're there to help you find the best solution. For every application, from components to a complete system.

## Cooling and Filter Systems for Hydraulic and Lube Oil Applications



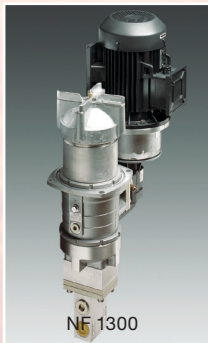
Cooling of the gearbox oil is via a plate heat exchanger which is supplied by a water / glycol mixture also used to cool the generator. Heat is then dissipated via a heat exchanger.



Air Cooled lubrication system with motor / pump filtration system.



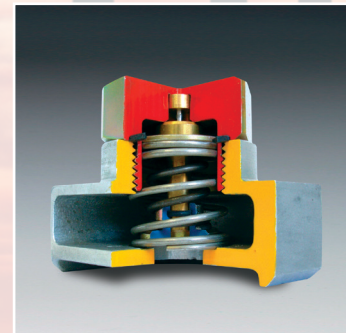
**Gearbox Generator Cooling:**  
Fluid: Oil or Water / Glycol



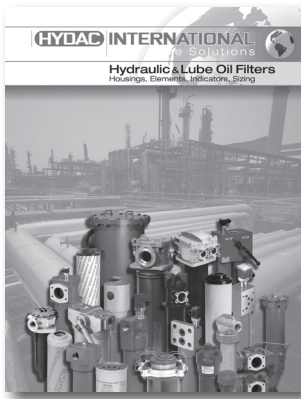
**Gearbox Filtration:**  
Motor Pump Unit with Filtration



**Gearbox Generator Inverter Cooling:**  
Water pump / control package

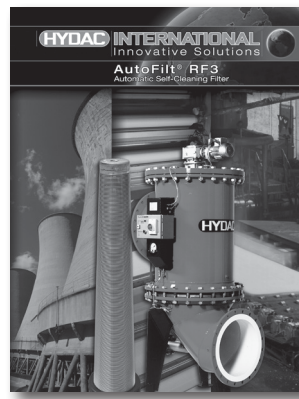


Integral pressure and thermally-controlled bypass valve on the cooler



## Hydraulic & Lube Oil Filters

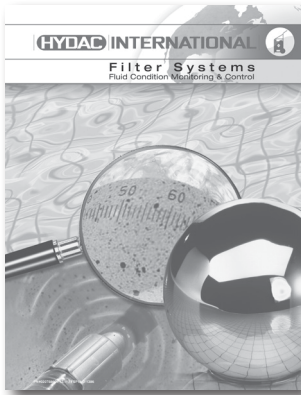
- Inline Filters
- Inline Duplex Filters
- In-Tank Filters
- In-Tank Inline Duplex Filters
- In-Tank Return Line Filters
- In-Tank Suction Filters
- Inside Tank Filters
- Manifold Mount Filters
- Modular Stacking Filters
- Manifold Cartridge Filters
- Low, Med. & High Press. Filters
- Filter Elements
- Clogging Indicators



## Process Filtration

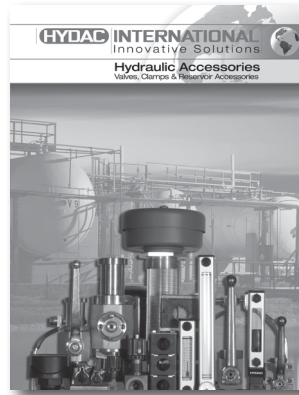
The AutoFit® RF3 is an automatic self-cleaning filtration system designed for continuous maintenance free filtration of water.

- 20 - 31,000 gpm flow rates
- 2" - 36" ANSI flange sizes
- 25 - 3000 micron ratings
- 25 to 150 psi operating pressures
- ASME Code certification
- Electric, Pneumatic, or Electro-pneumatic power source



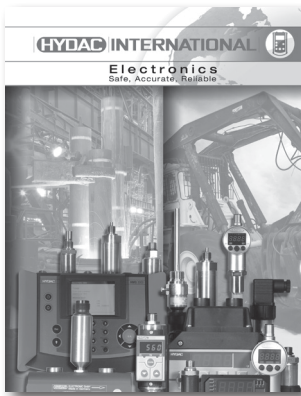
## Filter Systems

- Contamination Monitors
- Water Sensors
- Offline Filtration
- Water & Solid Removal
- Portable Data Recorder
- Portable Particle Counters
- Portable Filters
  - Hand-held
  - Wheeled Carts
  - Mobile Fluid Cleaner



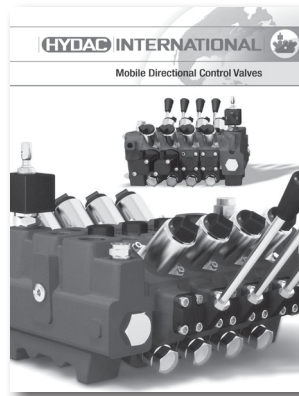
## Hydraulic Accessories

- Valves
  - High & Low Press. Ball Valves
  - Flow Control Valves
  - Hose Break Valves
  - Metric Cartridge Valves
- Clamps
  - DIN 3015 Clamps
  - Standard Clamps
  - Custom Solutions
- Accessories
  - Breathers & Filler Breathers
  - Fluid Level Indicators
  - Suction Strainers
  - Gauge Isolators
  - TestPoints



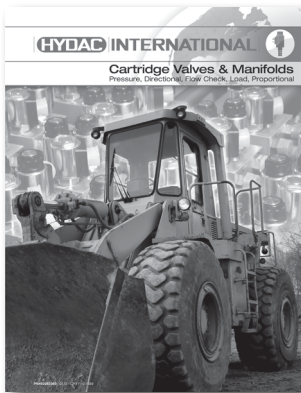
## Electronics

- Pressure Transducers
- Special Environment Transducers
- Pressure Switches
- Display Units
- Temperature Transducers
- Temperature Switches
- Level Sensors
- Flow Sensors
- Diagnostic Equipment
- Adapters
- Connectors
- Mounting Kits
- Demonstration Kits



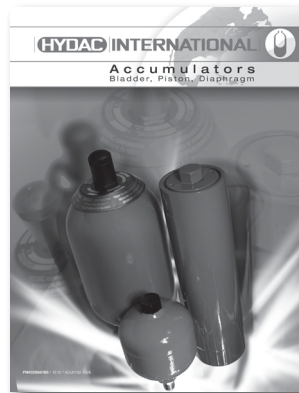
## Mobile Hydraulics

- Sectional & Monoblock Configurations
- Manual, Hydraulic Pilot, Electro Hydraulic, Pneumatic Actuators
- Nominal flow - 14 to 42 gpm
- Maximum Pressure 5000 psi
- Special configurations to help you control fixed or variable displacement pumps
- Custom solutions in a single all-inclusive package
- Special adapted spool configurations according to your needs



## Cartridge Valves & Manifolds

- Pressure Control Valves
- Pressure Relief Valves
- Pressure Reducing/Relieving Valves
- Flow Control & Regulator Valves
- Check Valves
- Counterbalance Valves
- Solenoid Control Valves
- Directional Control Valves
- Proportional Valves
- Solenoid Coils
- Line Bodies & Form Tools
- Manifold Accessories
- Seal Kits & Adjustment Kits



## Accumulators

- Bladder Accumulators
- Diaphragm Accumulators
- Piston Accumulators
- Nitrogen Bottles
- Pulsation Dampeners
- Thermal Fuse Caps
- Safety & Shut-off Blocks
- Charging & Gauging Units
- Permanent Gauging Blocks
- Mounting Components
- Sizing Information
- Spare Parts, Seal Kits & Tools

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