

# HYDAC INTERNATIONAL

## Standard Coolers

Air Cooled / Liquid Cooled





# Components, Systems and Service. All from one Company.

Our fluid engineering solutions are defined by the scope and complexity of our customers' requirements.

Our products range from individually designed components in the fields of fluid engineering, hydraulics and electronics right up to complete systems for specific functions.

All components and systems are conceived and designed in-house. Experienced industrial and product specialists develop innovative products and efficient solutions for high-quality, cost-effective production. Throughout the globe, our production facilities share one common goal: quality. We take great pride in both our products and solutions.

## Industries and Applications



Offshore / Marine



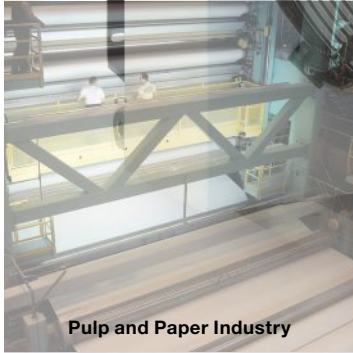
Construction Equipment



Rolling Mill / Press



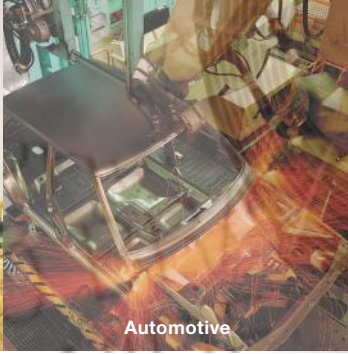
Wind Power



Pulp and Paper Industry



Agriculture



Automotive



Utility Vehicles

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## Cooling System Division

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## NOTE

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## Cooling System Expertise - For Industrial and Mobile Engine and e-Mobility Applications

Hydraulic and lubrication systems touch nearly every aspect of industrial equipment and mobile machines, so high performance and reliability is crucial. Whether the requirement is hydraulic power transmission, heat removal, corrosion protection, or lubrication; fluid quality plays an important role.

For mobile machines, varying ambient conditions make temperature control essential. In hydraulic systems, heat is lost during energy transport and conversion. The function of a cooling system is to dissipate this heat in order to ensure efficient machine performance. Effective

cooling can contribute to increased fluid and equipment service life, thereby reducing life cycle costs.

HYDAC coolers, heat exchangers, and cooling systems and combi-coolers not only perform well in hydraulic systems, they are also an effective means of cooling electric drives and motors, engines, generators, inverters and transformers, as well as mobile machine gearbox lubrication systems.

Whether the cooling medium is air or water, return or bypass flow, HYDAC has standard and customized solutions to meet the most demanding requirements.

### Examples of HYDAC Expertise:

#### FWKS Fluid / Water Cooling Systems

- Cooling of circuits which use mineral oil or water glycol
- Compact design with plastic tank, circulation pump and plate heat exchanger
- Various sizes with cooling capacities up to 100 kW and flow rates up to 150 l/min
- Can be used as a temperature-controlled intermediate circuit. In this way the contamination and corrosion in the coolant circuits which could arise as a result of direct cooling with poor water quality is prevented.



#### Combi-coolers

From combining an engine radiator and charge air into one package, to adding a hydraulic oil cooler, transmission oil cooler and/or a fuel cooler, our combi-coolers can be designed for any application.



#### FLKS Fluid / Air Cooling Systems

- Cooling of circuits which use mineral oil or water glycol
- Compact design with plastic tank, circulation pump, cooling element and fan
- Machine tools and e-Mobility cooling



## **B** Air Cooled Oil Coolers for Mobile Applications

These coolers use a combination of high performance cooling elements, and long life DC electric or hydraulically driven 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 is required.

# MOBILE COOLERS

## ELD Series

DC Motor Drive



### 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

### Applications



Agricultural



Material Handling



Construction



Utility



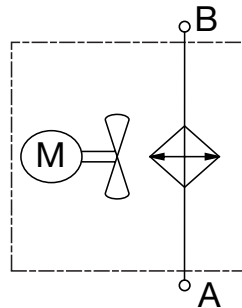
Railways



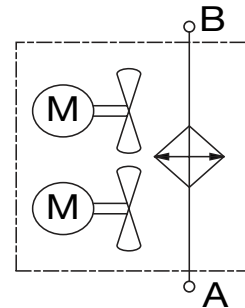
Forestry

### Hydraulic Symbol

Sizes 1 - 4.5



Sizes 5 - 6



### General

<b>Materials</b>	Housing: welded steel Heat Exchanger: aluminum, brazed bar-and-plate Fan: 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 (Contact factory for other fluid usages)
<b>Ambient Temperature</b>	50° - 104°F (10° - 40°C)
<b>Max. 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

### Specifications

Size	Preferred Part Number	Motor Capacity (kW) 12v / 24v	Current Draw (Amps) 12v / 24v	In-Rush Current (@20ms)	Fan Dia. (mm) / (in)	Noise Level dBa* (1 Meter)	Weight (lbs.)
ELD 1	2592772	0.10 / 0.11	8 / 4.5	45/34	190 / 7.5	73	7
ELD 1.5	2595792	0.10 / 0.11	8 / 4.5	45/34	190 / 7.5	73	9
ELD 2	2592521	0.20 / 0.21	15 / 8	80 / 78	255 / 10	74	21
ELD 3	2593214	0.27 / 0.28	21 / 11	80 / 70	305 / 12	79	25
ELD 4	2592525	0.32 / 0.31	25 / 12	120 / 76	385 / 15.2	76	35
ELD 4.5	2592774	0.32 / 0.31	25 / 12	120 / 76	385 / 15.2	76	49
ELD 5	2592776	0.54 / 0.56	42 / 22	160 / 140	305 / 12	80	67
ELD 6	2592778	0.64 / 0.62	50 / 24	240 / 152	385 / 15.2	77	81

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

## Model Code

**ELD 1.5H 3.5 12 S X X X**

**Model** \_\_\_\_\_  
 ELD = Air Cooled Oil Cooler with DC-Powered Fan (*Brushless option available, contact factory*)

**Size** \_\_\_\_\_  
 1H, 1.5H, 2H, 3H, 4H, 4.5H, 5H, 6H

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

**Fan Motor Voltage** \_\_\_\_\_  
 12 = 12 volt DC  
 24 = 24 volt DC

**Air Flow Direction** \_\_\_\_\_  
 S = Suction (*through heat exchanger, exhausting through fan*)  
 B = Blowing (*through fan, exhausting through heat exchanger*)

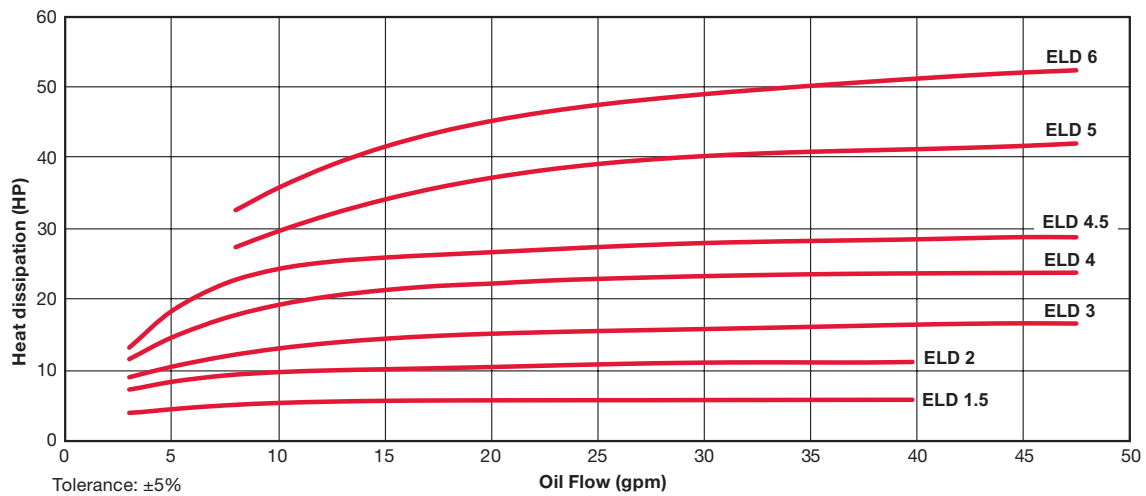
**Options** \_\_\_\_\_  
 (omit) = None  
 IBT = Internal Thermostatic Bypass Valve  
 IBP = Internal Pressure Bypass Valve

**Opening Temperature (IBT Only)** \_\_\_\_\_  
 45 = 113°F (45°C) (*closes at 131°F*)  
 50 = 130°F (50°C) (*closes at 150°F*)  
 60 = 140°F (60°C) (*closes at 158°F*)

**Opening Pressure Drop (IBT & IBP Only)** \_\_\_\_\_  
 2 = 2 bar (29 psi)  
 3 = 3 bar (45 psi)  
 4 = 4 bar (58 psi)  
 TS-120 = Inline Thermostat, Fixed 120°F  
 TS-140 = Inline Thermostat, Fixed 140°F  
 TS-160 = Inline Thermostat, Fixed 160°F  
 F = Foot Mount

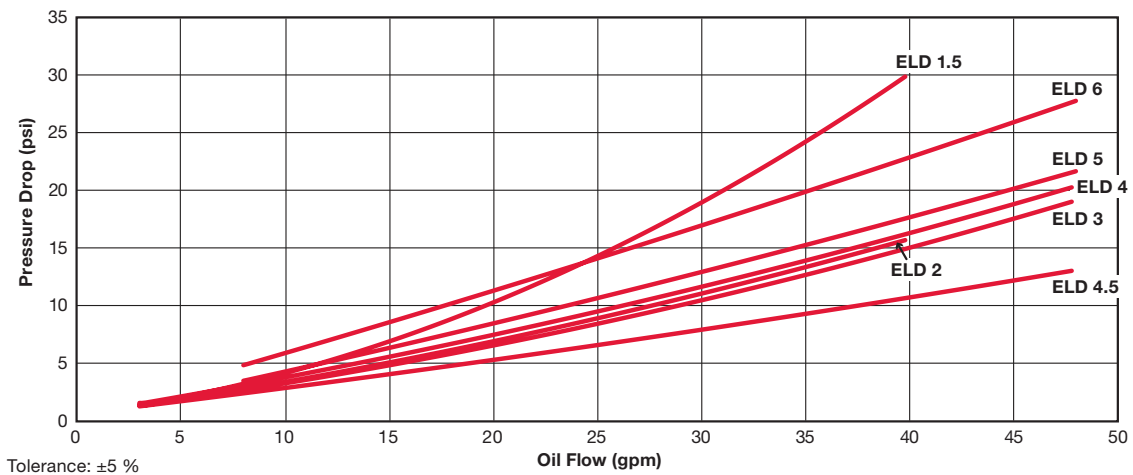
*Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability*

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



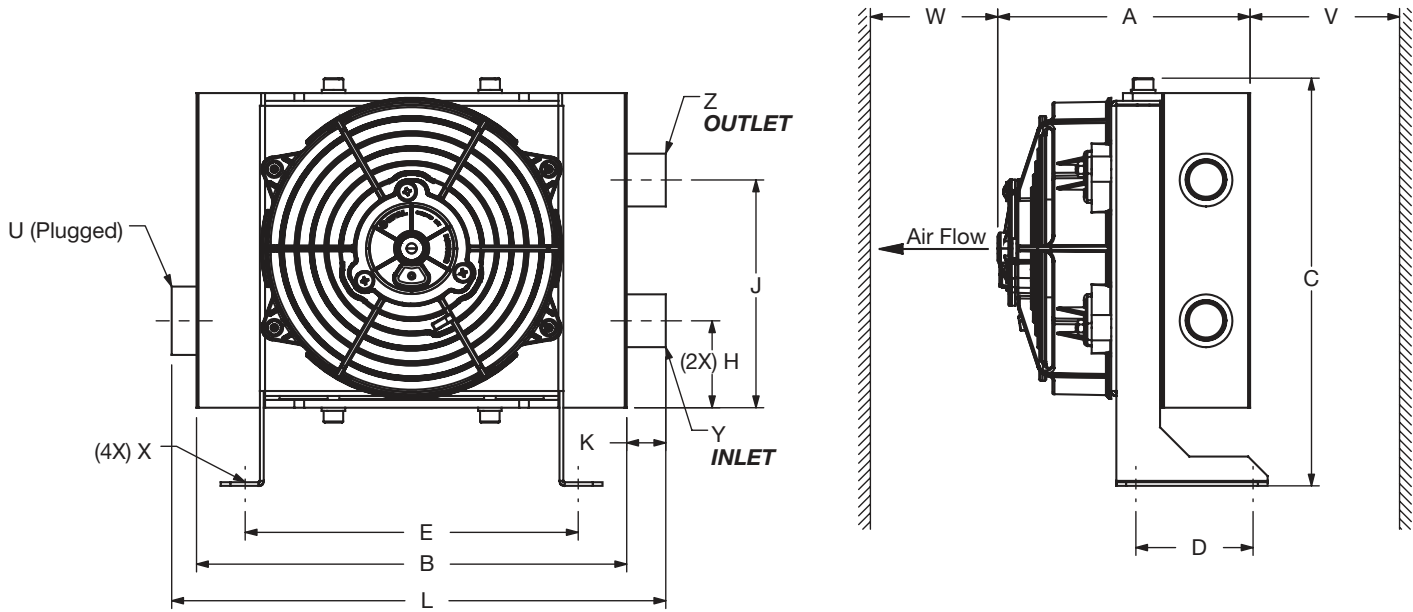
Cooling capacity is dependent on the oil flow rate and the temperature difference  $\Delta T$  between oil inlet and air temperature.

## Pressure Drop @ 30 cSt



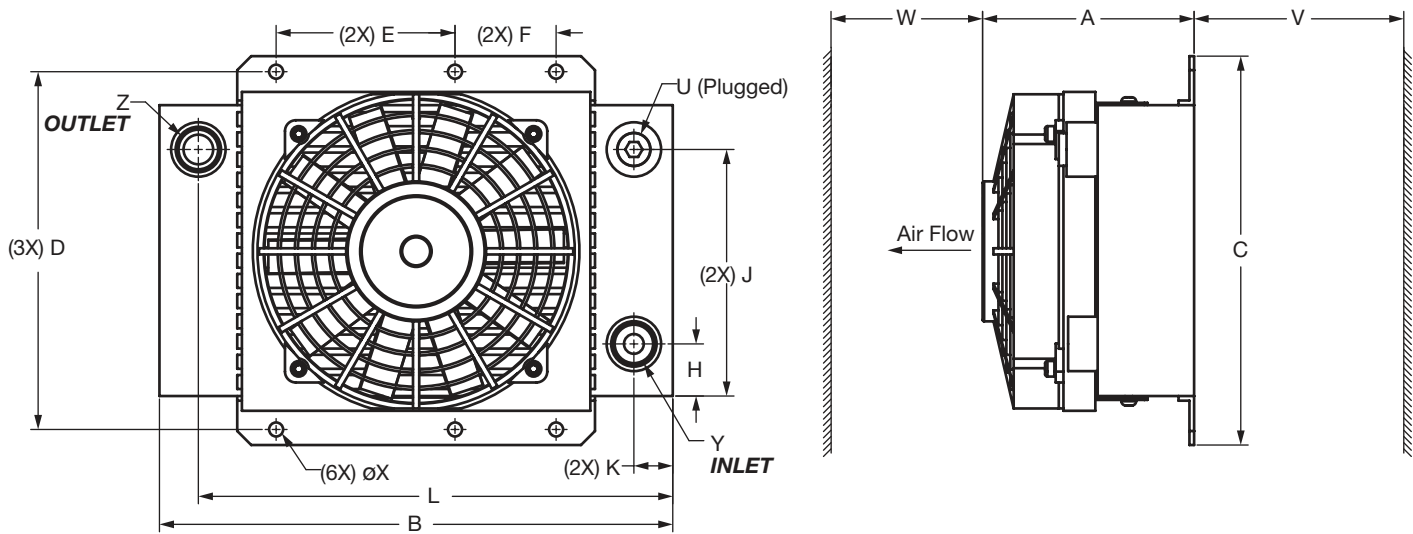
# MOBILE COOLERS

## Dimensions ELD Size 0



Size	A	B	C	D	E	F	H	J	K	L	V	W	U	X	Y	Z
0	5.51 [140]	8.66 [220]	8.15 [207]	2.24 [57]	6.69 [170]	N/A	1.77 [45]	4.61 [117]	0.79 [20]	9.96 [253]	3.94 [100]	7.87 [200]	1/2" NPT	ø0.25x0.50 [ø6.5x12]	SAE-8	SAE-8

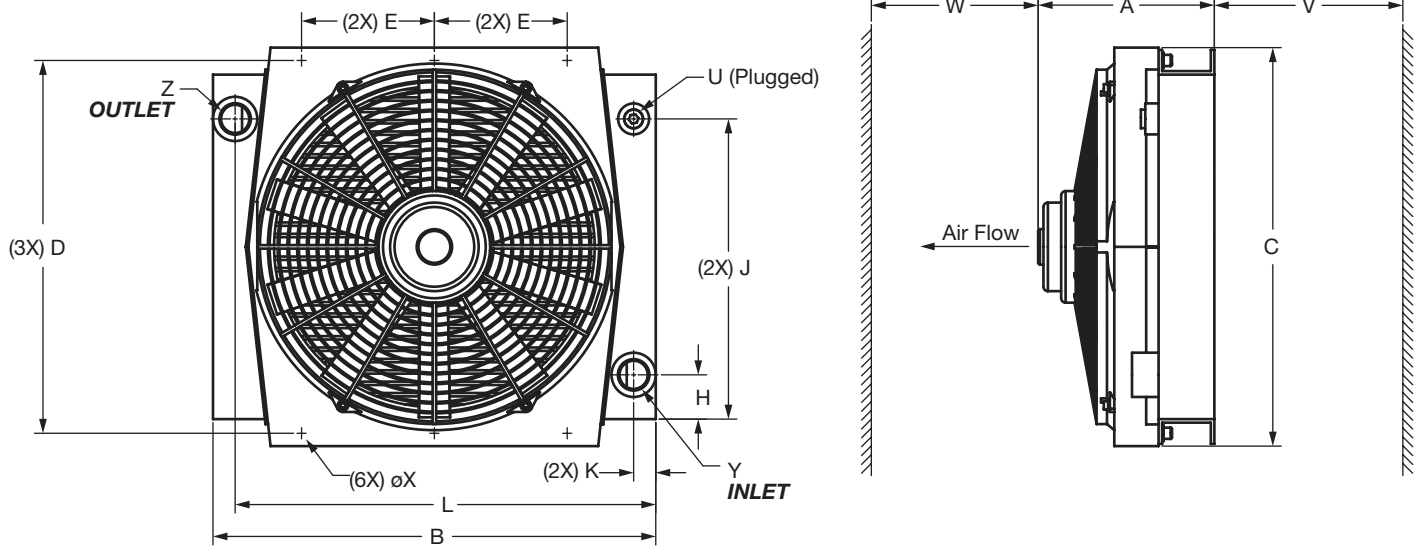
## Dimensions ELD Size 1 & 1.5



Size	A	B	C	D	E	F	H	J	K	L	V	W	U	X	Y	Z
1	4.69 [119]	11.81 [300]	9.72 [247]	8.86 [225]	2.56 [65]	1.97 [50]	1.10 [28]	6.02 [153]	0.98 [25]	9.84 [250]	3.94 [100]	7.87 [200]	1/2" NPT	ø0.35 [ø9]	SAE-12	SAE-12
1.5	5.35 [136]	12.99 [330]	9.84 [250]	9.06 [230]	4.53 [115]	2.56 [65]	1.32 [34]	6.24 [158]	0.98 [25]	12.01 [100]	3.94 [100]	7.87 [200]	1/2" NPT	ø0.35 [ø9]	SAE-12	SAE-12

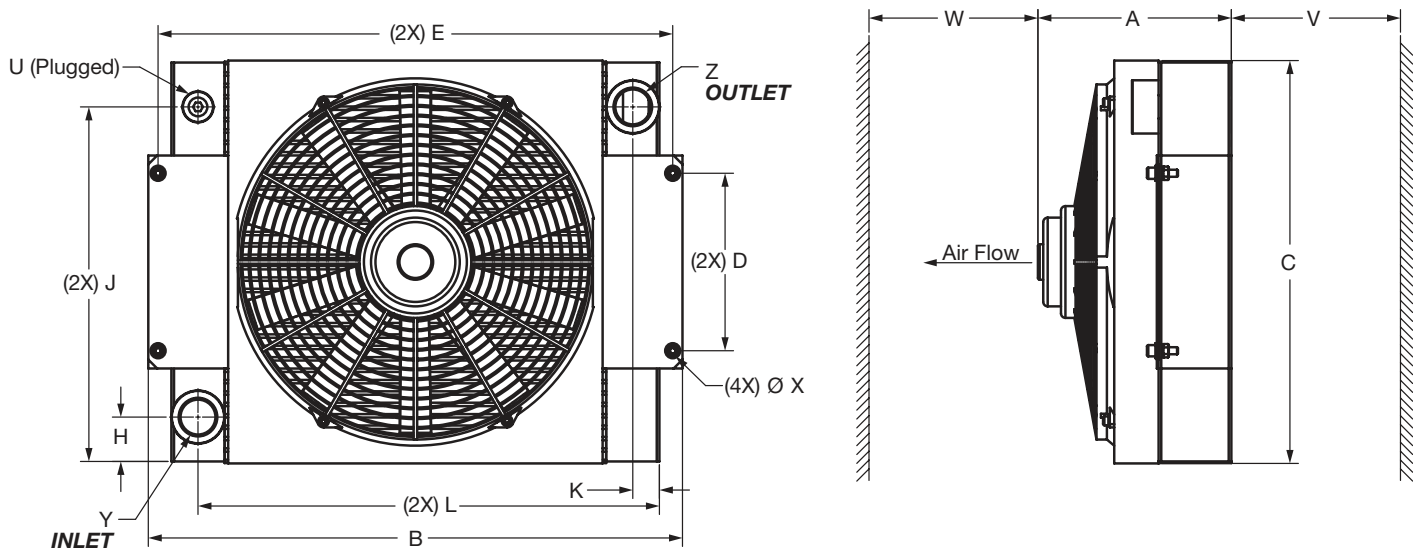


## Dimensions ELD Size 2 - 4



Size	A	B	C	D	E	F	H	J	K	L	V	W	U	X	Y	Z
2	8.15 [207]	15.12 [384]	12.32 [313]	11.34 [288]	3.15 [80]	N/A	1.18 [30]	9.02 [229]	1.18 [30]	13.94 [354]	5.91 [150]	9.84 [250]	1/2" NPT	ø0.39x0.55 [ø10x14]	SAE-16	SAE-16
3	8.15 [207]	16.54 [420]	14.02 [356]	12.95 [329]	3.94 [100]	N/A	1.42 [36]	10.47 [266]	0.98 [25]	15.55 [395]	7.09 [180]	11.81 [300]	1/2" NPT	ø0.39x0.55 [ø10x14]	SAE-16	SAE-16
4	7.83 [199]	19.69 [500]	17.72 [450]	16.57 [421]	5.91 [150]	N/A	1.97 [50]	13.35 [339]	0.98 [25]	18.7 [475]	7.87 [200]	15.75 [400]	1/2" NPT	ø0.41x0.50 [ø11x13]	SAE-16	SAE-16

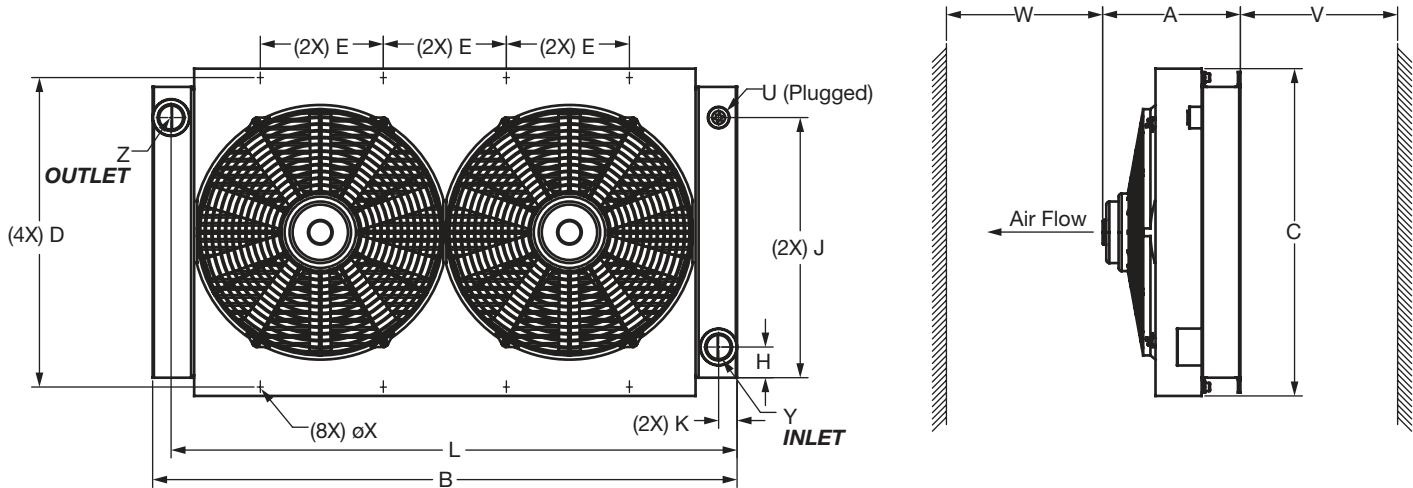
## Dimensions ELD Size 4.5



Size	A	B	C	D	E	F	H	J	K	L	V	W	U	X	Y	Z
4.5	8.58 [218]	23.70 [602]	17.87 [454]	7.87 [200]	22.83 [580]	N/A	1.97 [50]	15.73 [400]	1.18 [30]	20.47 [520]	7.87 [200]	15.75 [400]	1/2" NPT	ø0.47 [ø12]	SAE-20	SAE-20

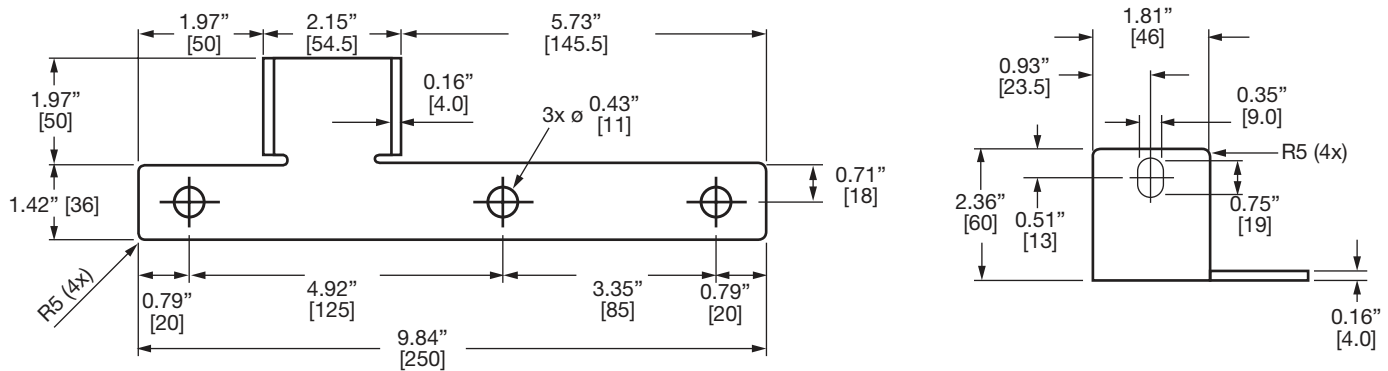
# MOBILE COOLERS

## Dimensions ELD Size 5 - 6



Size	A	B	C	D	E	F	H	J	K	L	V	W	U	X	Y	Z
5	9.13 [232]	31.89 [810]	18.9 [480]	17.72 [450]	6.69 [170]	N/A	1.95 [50]	14.59 [371]	1.18 [30]	30.73 [781]	7.87 [200]	15.75 [400]	1/2" NPT	ø0.39x0.55 [ø10x14]	SAE-20	SAE-20
6	8.86 [225]	37.4 [950]	20.94 [532]	19.8 [503]	7.87 [200]	N/A	1.96 [50]	16.65 [423]	1.18 [30]	36.22 [920]	9.84 [250]	19.69 [500]	1/2" NPT	ø0.39x0.71 [ø10x18]	SAE-20	SAE-20

## Dimensions ELD Foot Bracket Size 2 - 4 / 5 - 6





# MOBILE COOLERS

## ELH Series

Hydraulic Motor Drive



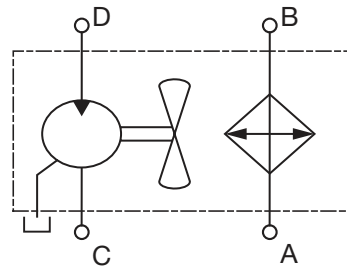
### Description

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  
(Contact Factory)

### Hydraulic Symbol



### Applications



Agricultural



Offshore



Construction



Railways



Industrial



Utility



Material Handling

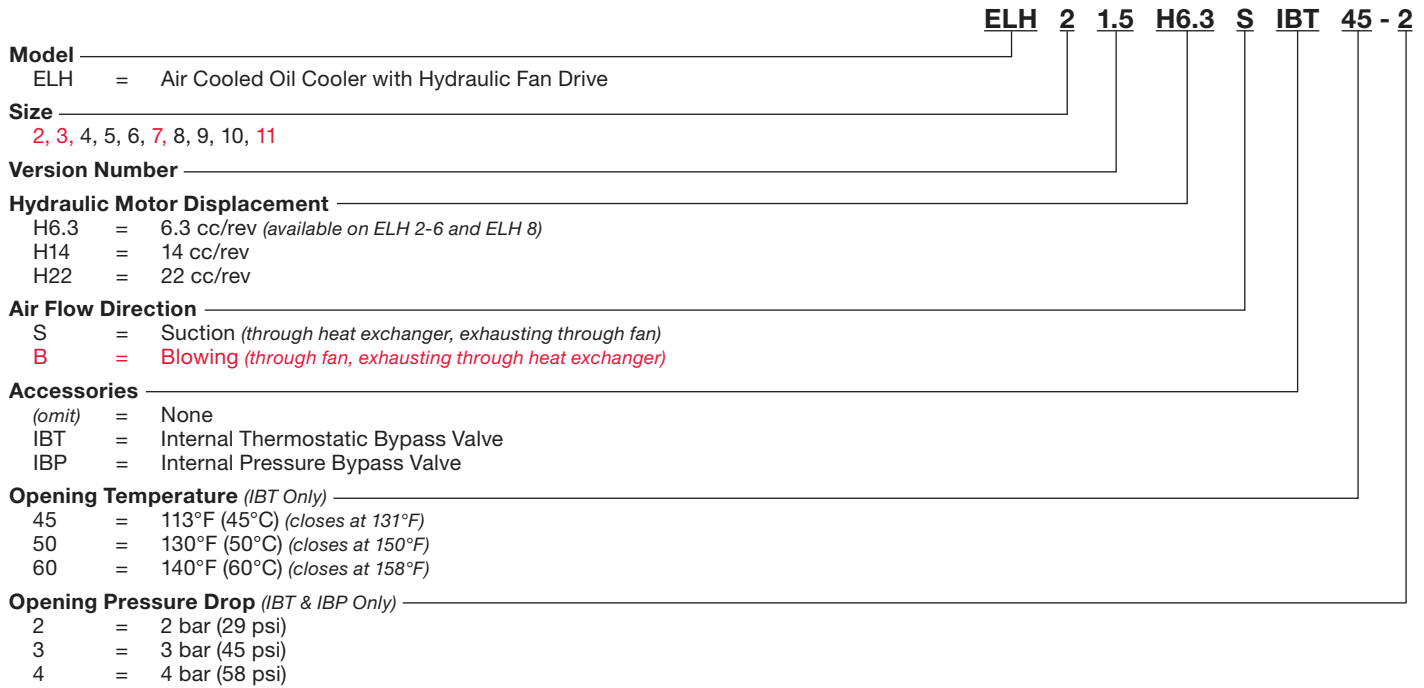


Forestry

### General

<b>Materials</b>	Housing: welded steel Heat exchanger: aluminum, brazed bar-and-plate Fan: plastic Motor: aluminum housing, steel gears and shaft
<b>Max. Oil Temp.</b>	266°F (130°C)
<b>Max. Operating Pressure</b>	230 psi (16 bar)
<b>Mounting Orientation</b>	All positions
<b>Fluids</b>	Mineral oil to DIN 51524 Part 1 and 2 (Contact factory for other fluid usages)
<b>Filtration</b>	ISO/DIS 4406 Code 19/16- Filtration grade B25>75
<b>Motor</b>	<ul style="list-style-type: none"> <li>- Max. Drain Pressure: 29 psi (2 bar)</li> <li>- Fluid Viscosity Range: 10-600 cSt (recommended 30-45 cSt)</li> <li>- Fluid Temperature Range: up to 194° F (90°C)</li> </ul>

## Model Code



*Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability*

## Technical Specifications

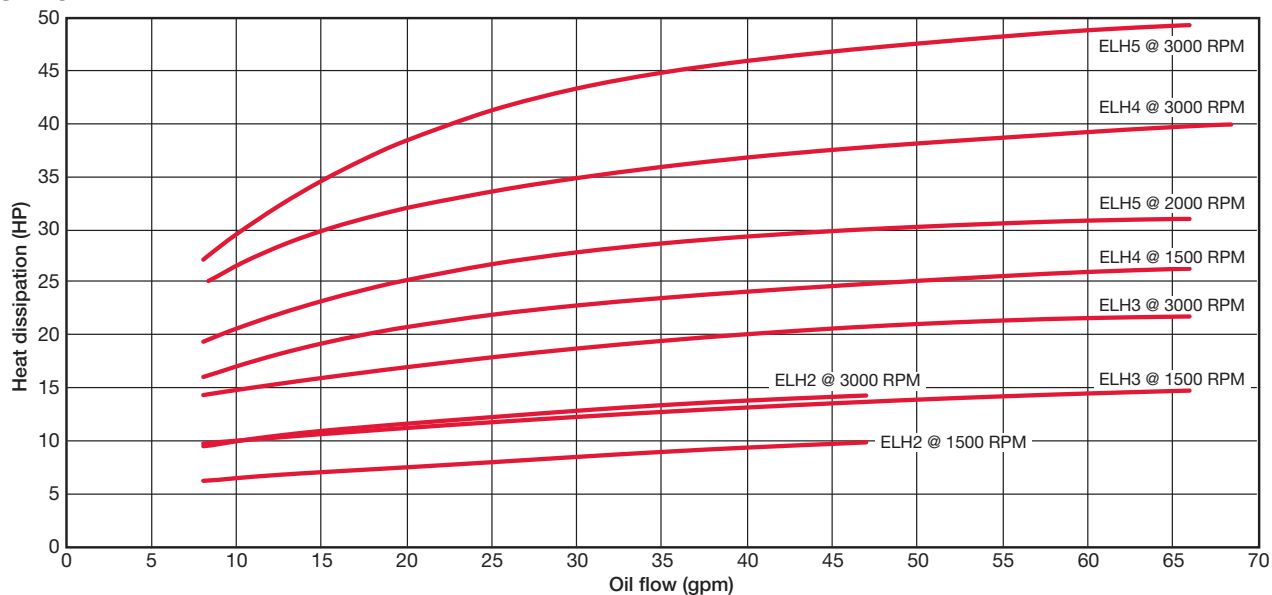
Size	Motor Displacement (cm <sup>3</sup> /rev)	Operating Speed Range (rpm)	Δp of Motor @ max RPM @ 34 cst (psi)	Motor Oil Flow @1500 RPM (gpm)	Continuous Motor Operating Pressure (psi)	Noise Level @1000 RPM (dBa @1 Meter)*	Weight (lbs.)
ELH 2	6.3 / 14 / 22	1000 / 3000	290	2.8 / 5.7 / 9.7	3625 / 3625 / 2175	69	25
ELH 3	6.3 / 14 / 22	1000 / 3000	290	2.8 / 5.7 / 9.7	3625 / 3625 / 2175	69	29
ELH 4	6.3 / 14 / 22	1000 / 3000	725 / 435 / 290	2.8 / 5.7 / 9.7	3625 / 3625 / 2175	70	40
ELH 5	6.3 / 14 / 22	1000 / 3000	1015 / 435 / 290	2.8 / 5.7 / 9.7	3625 / 3625 / 2175	70	53
ELH 6	6.3 / 14 / 22	1000 / 3000	2175 / 1015 / 725	2.8 / 5.7 / 9.7	3625 / 3625 / 2175	70	95
ELH 7	14 / 22	1000 / 2800	3190 / 2030	5.7 / 9.7	3625 / 2175	77	166
ELH 8	6.3 / 14 / 22	1000 / 2800	2900 / 1160 / 870	2.8 / 5.7 / 9.7	3625 / 3625 / 2175	76	148
ELH 9	14 / 22	1000 / 2200	1885 / 1305	5.7 / 9.7	3625 / 2175	78	188
ELH 10	14 / 22	1000 / 1800	3335 / 1885	5.7 / 9.7	3625 / 2175	82	243
ELH 11	14 / 22	1000 / 1600	3625 / 2175	5.7 / 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.

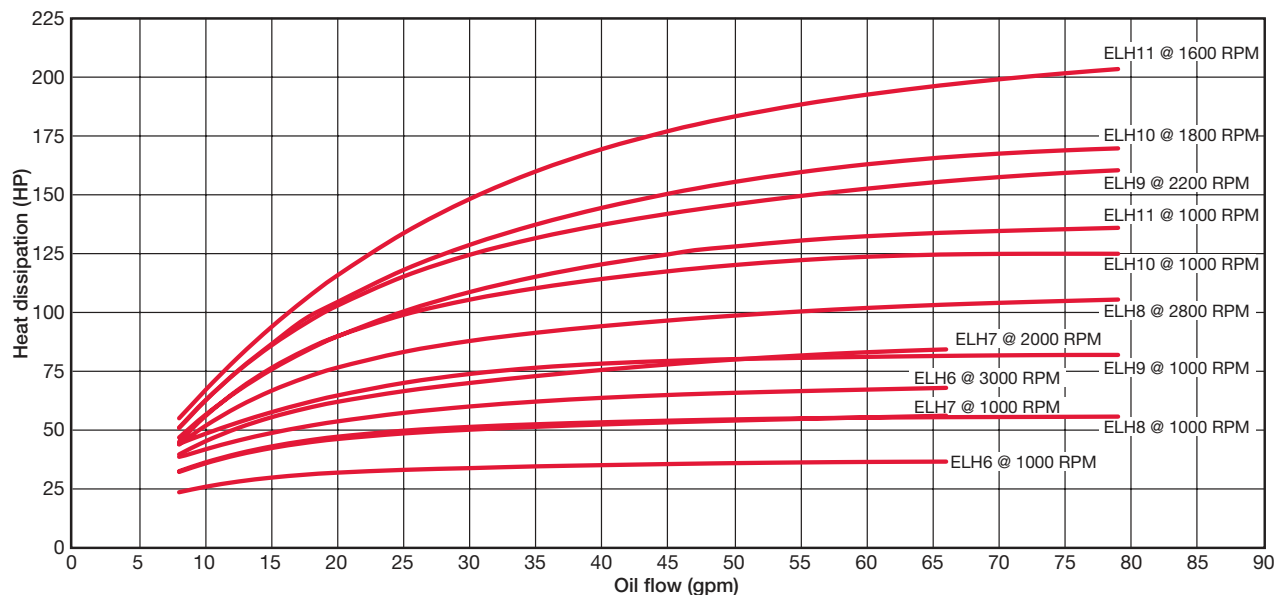
# MOBILE COOLERS

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

Sizes 2-5

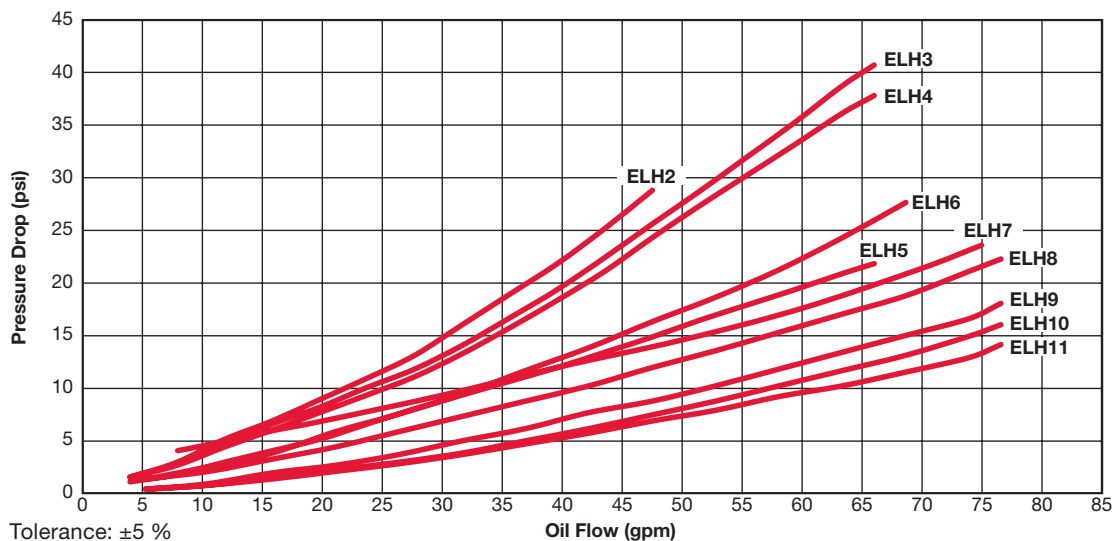


Sizes 6-11



Cooling capacity is dependent on the oil flow rate and the temperature difference  $\Delta T$  between oil inlet and air inlet.

Pressure Drop @ 30cSt



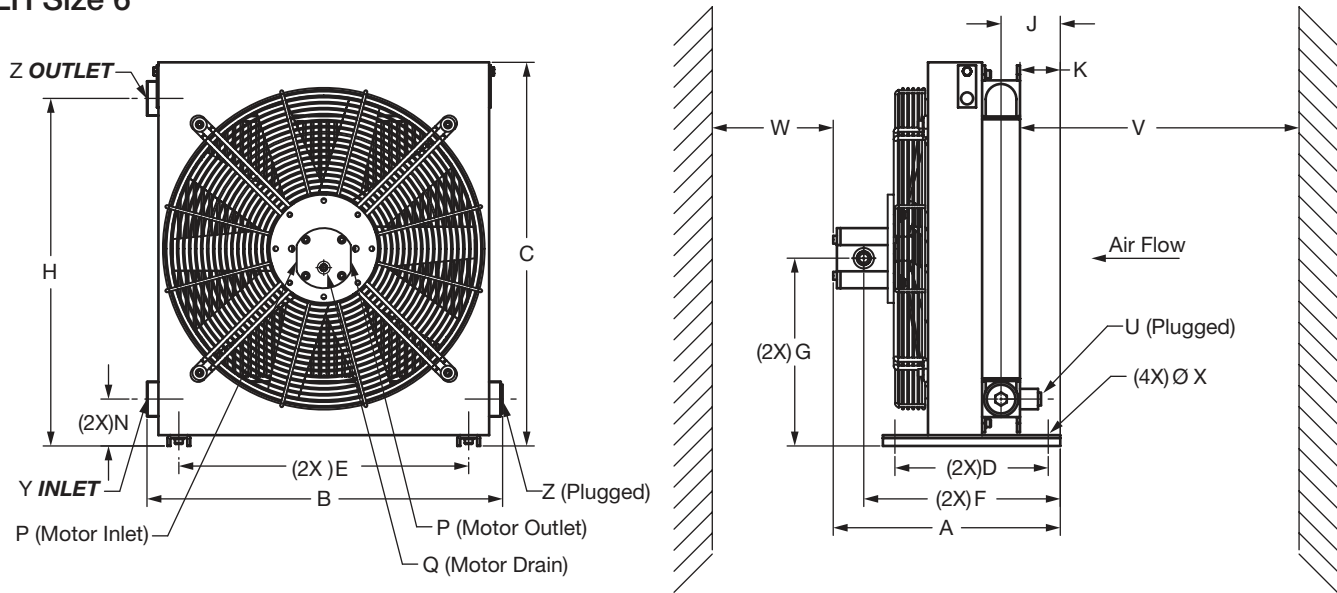
Tolerance:  $\pm 5\%$

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



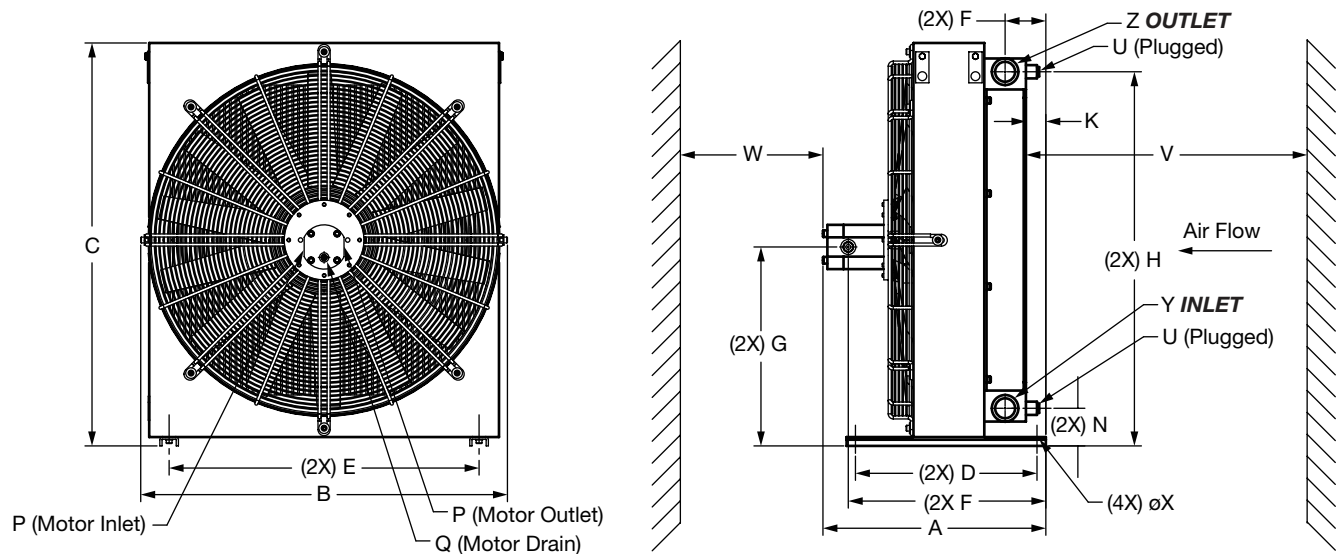
# MOBILE COOLERS

## Dimensions ELH Size 6



Size	A (6.3cc)	A (14cc)	A (22cc)	B	C	D	E	F (6.3cc)	F (14cc)	F (22cc)	G	H	J
6	14.87 [378]	15.37 [390]	15.93 [405]	23.17 [589]	25.12 [638]	10.04 [255]	18.98 [482]	12.87 [327]	13.12 [333]	13.40 [340]	12.30 [312]	22.76 [578]	3.88 [99]
Size	K	L	M	N	P	Q	U	V	W	X	Y	Z	
6	2.64 [67]	N/A	N/A	3.08 [78]	SAE-10	SAE-4	1/2" NPT	22.62 [575]	39.37 [1000]	ø0.35 [ø9]	SAE-20	SAE-20	

## Dimensions ELH Size 7 - 8

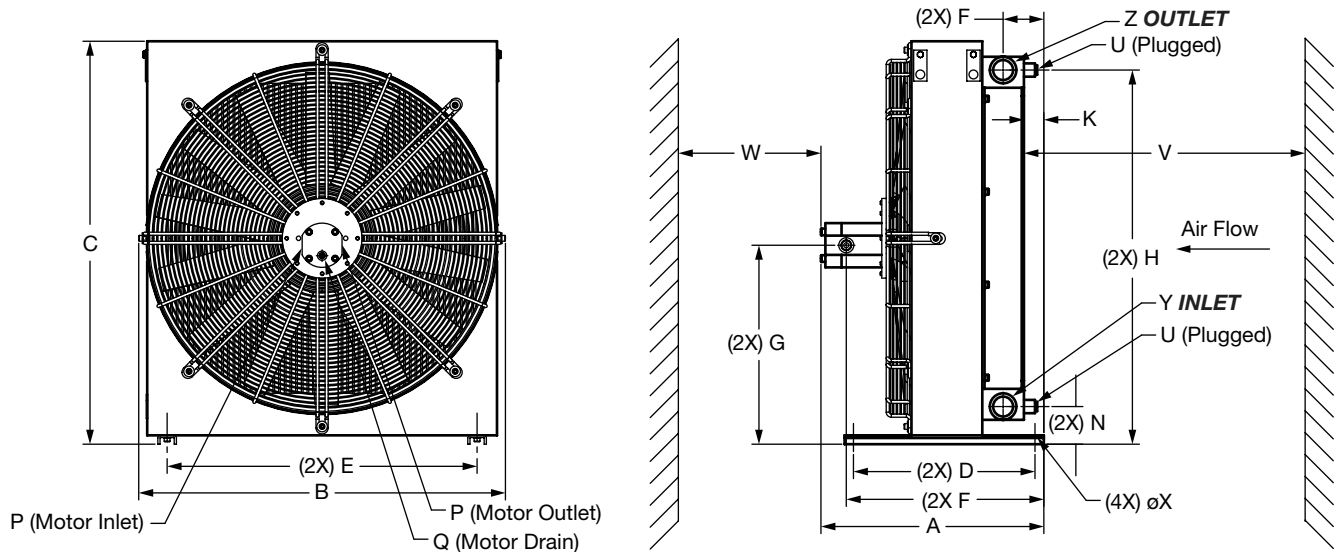


Size	A (6.3cc)	A (14cc)	A (22cc)	B	C	D	E	F (6.3cc)	F (14cc)	F (22cc)	G	H	J
7	N/A	17.72 [450]	18.06 [459]	27.80 [706]	28.58 [726]	16.14 [410]	22.05 [560]	N/A	15.24 [387]	15.52 [394]	14.07 [357]	26.50 [673]	2.89 [73]
8	15.07 [383]	15.57 [395]	16.13 [410]	27.24 [692]	30.08 [764]	10.04 [255]	18.98 [482]	13.06 [332]	13.31 [338]	13.59 [345]	14.78 [375]	27.76 [705]	3.70 [94]
Size	K	L	M	N	P	Q	U	V	W	X	Y	Z	
7	1.65 [42]	N/A	N/A	2.87 [73]	SAE-10	SAE-4	1/2" NPT	25.00 [635]	42.00 [1067]	ø0.39x0.78 [ø10x20]	SAE-20	SAE-20	
8	2.09 [53]	N/A	N/A	3.03 [77]	SAE-10	SAE-4	1/2" NPT	27.56 [700]	43.31 [1100]	ø0.35 [ø9]	SAE-20	SAE-20	

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



## Dimensions ELH Size 9 - 11

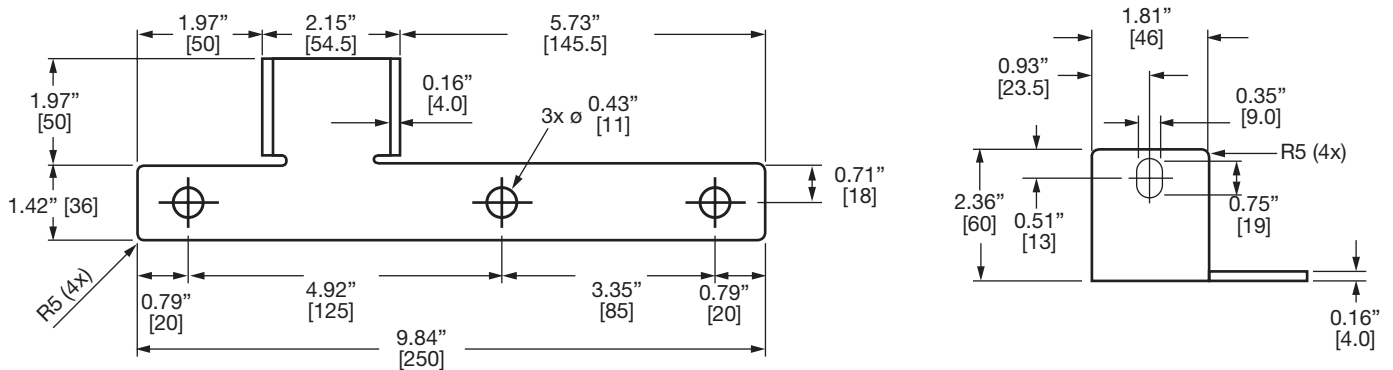


Size	A (6.3cc)	A (14cc)	A (22cc)	B	C	D	E	F (6.3cc)	F (14cc)	F (22cc)	G	H	J
9	N/A	19.82 [503]	20.38 [518]	32.61 [828]	35.83 [910]	16.14 [410]	27.56 [700]	N/A	17.57 [446]	17.85 [453]	17.69 [449]	33.27 [845]	3.62 [92]
10	N/A	20.65 [525]	21.21 [539]	38.23 [971]	41.73 [1060]	18.11 [460]	27.56 [700]	N/A	18.39 [467]	18.67 [474]	20.84 [529]	39.37 [1000]	3.66 [93]
11	N/A	21.43 [544]	21.99 [559]	42.91 [1090]	46.46 [1180]	18.11 [460]	27.56 [700]	N/A	19.18 [487]	19.46 [494]	23.20 [589]	44.69 [1135]	3.66 [93]

Size	K	L	M	N	P	Q	U	V	W	X	Y	Z
9	1.77 [45]	N/A	N/A	3.35 [85]	SAE-10	SAE-4	1/2" NPT	35.43 [900]	47.24 [1200]	ø0.39x0.78 [ø10x20]	SAE-24	SAE-24
10	1.81 [46]	N/A	N/A	3.54 [90]	SAE-10	SAE-4	1/2" NPT	35.43 [900]	55.12 [1400]	ø0.35 [ø9]	SAE-24	SAE-24
11	1.81 [46]	N/A	N/A	2.95 [75]	SAE-10	SAE-4	1/2" NPT	39.37 [1000]	62.99 [1600]	ø0.35 [ø9]	SAE-24	SAE-24

## Dimensions ELH Mounting Foot Bracket Size 2 - 4

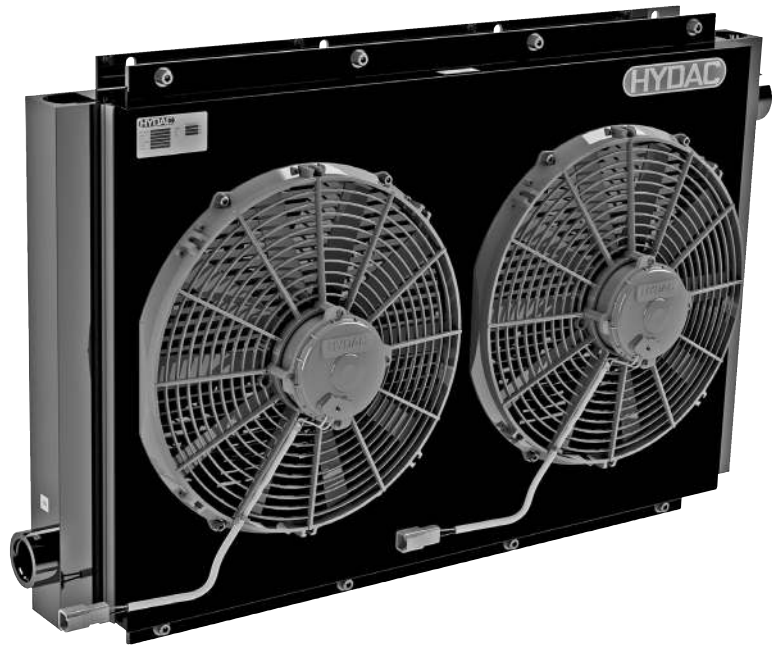
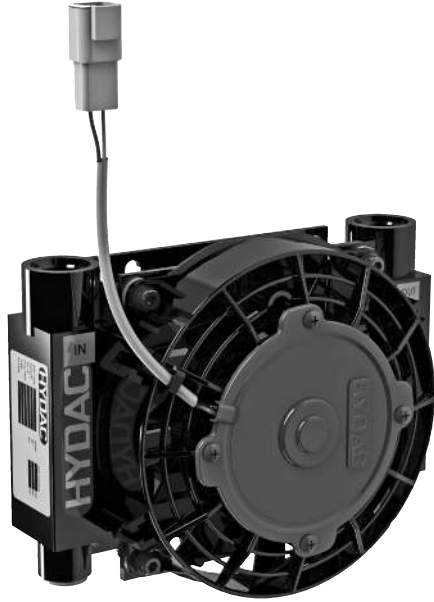


Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches [mm].

# MOBILE COOLERS

## ELX Series

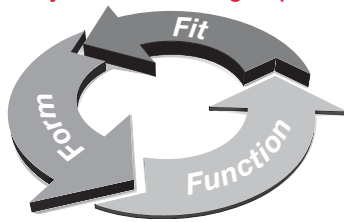
DC Motor Drive



### EXtreme

- Performance
- Value
- Durability
- Adaptability

Easy OEM Interchange Options



### Features

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.

- OEM interchangeable - performance and dimensional
- Bar-and-plate brazed aluminum core
- 12V & 24V DC fan (brushless option available)
- Rugged, lightweight, compact
- Provides the best heat transfer per given envelope size while minimizing pressure drop
- Side welded aluminum fittings/ports and tanks ensure structural integrity
- Standard SAE O-ring boss ports
- High resistance to vibration and mechanical stress
- All coolers feature a built-in SAE O-ring boss thermostat port
- Available with internal pressure or thermal bypass

### Applications



Agricultural



Municipal Vehicles



Construction



Railways



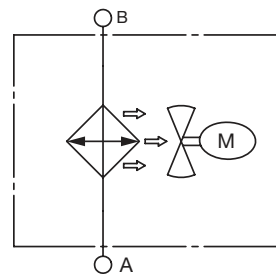
Forestry



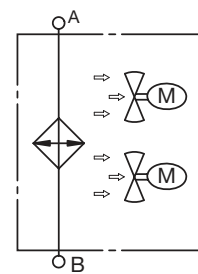
Cranes

### Hydraulic Symbol

Single Fan



Dual Fan



### Benefits

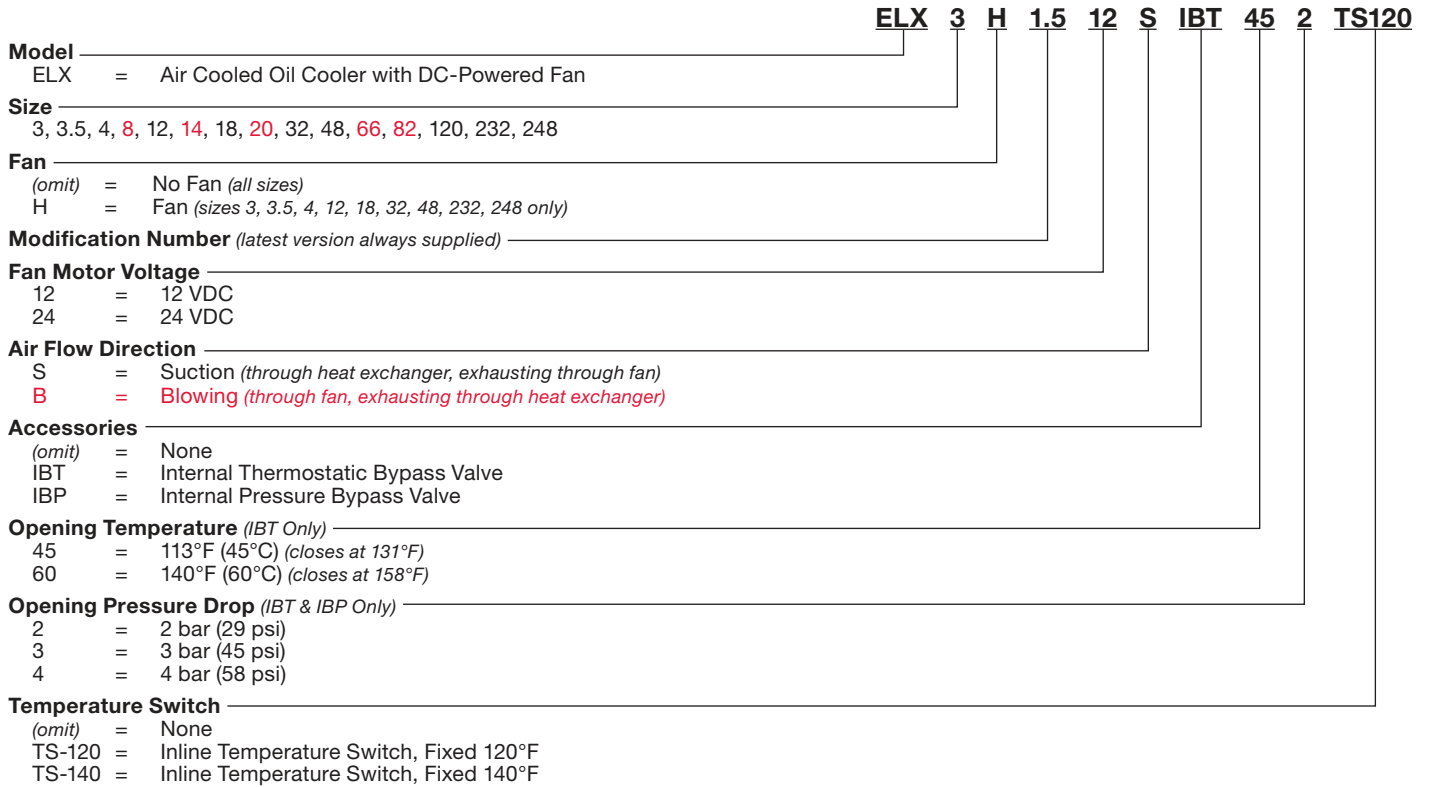
- Operates in challenging environments with IP 68 rating
- Up to 53 HP cooling capacity
- Rated flows up to 80 gpm
- Motor lifetimes up to 10,000 hours

### General

<b>Compatible Fluids</b>	Mineral oil to DIN 51524 Part 1 and 2 Water-glycol ( <i>contact factory for applications</i> )
<b>Temperature</b>	Max. Ambient: 120°F ; Max. Fluid: 266°F
<b>Pressure</b>	290 psi (16 bar) max. static pressure 230 psi (21 bar) max. dynamic pressure
<b>Fan</b>	Suction axial fan ( <i>std</i> ); Blower axial fan ( <i>opt</i> ) Note: cooling capacity reduced by 10% in "blower" configuration
<b>Motor</b>	12 VDC motor; 24 VDC motor Protection class IP68
<b>Materials</b>	Housing: welded steel Heat exchanger: aluminum, brazed bar-&-plate Fan: plastic
<b>Connections</b>	Electrical: Deutsch DTP04-2P Fluid: SAE O-ring boss

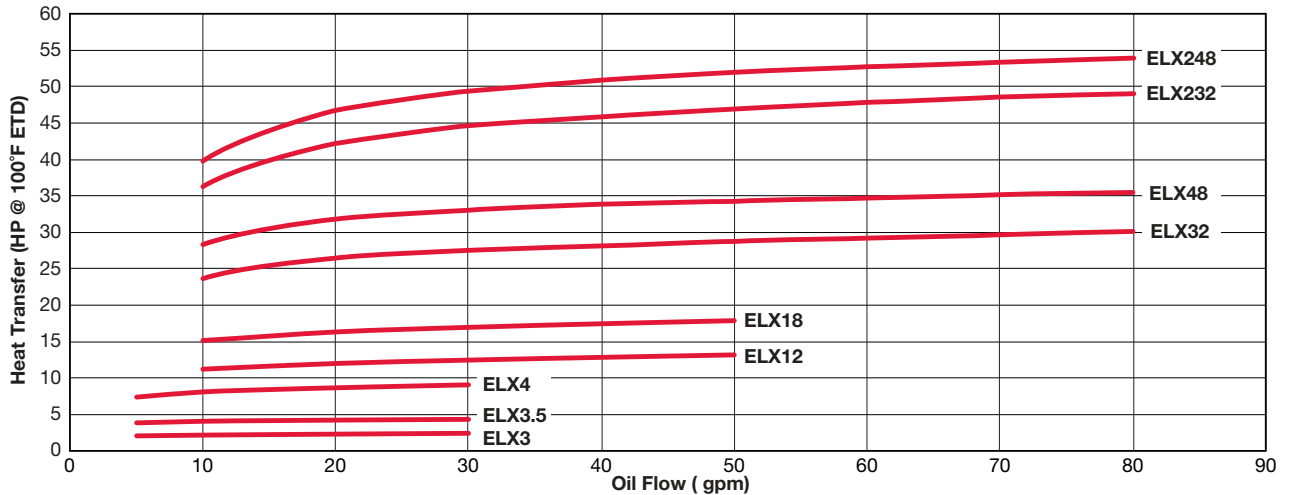
Preferred ELX Models	P/N
ELX 12 H 1.5 12 S SC	2957269
ELX 18 H 1.5 12 S SC	2957272
ELX 3 H 1.5 12 S SC	2957265
ELX 3.5 H 1.5 12 S SC	2957266
ELX 32 H 1.5 12 S SC	2957275
ELX 48 H 1.5 12 S SC	2957277
ELX 232 H 1.5 12 S SC	2957285
ELX 248 H 1.5 12 S SC	2957287

## Model Code

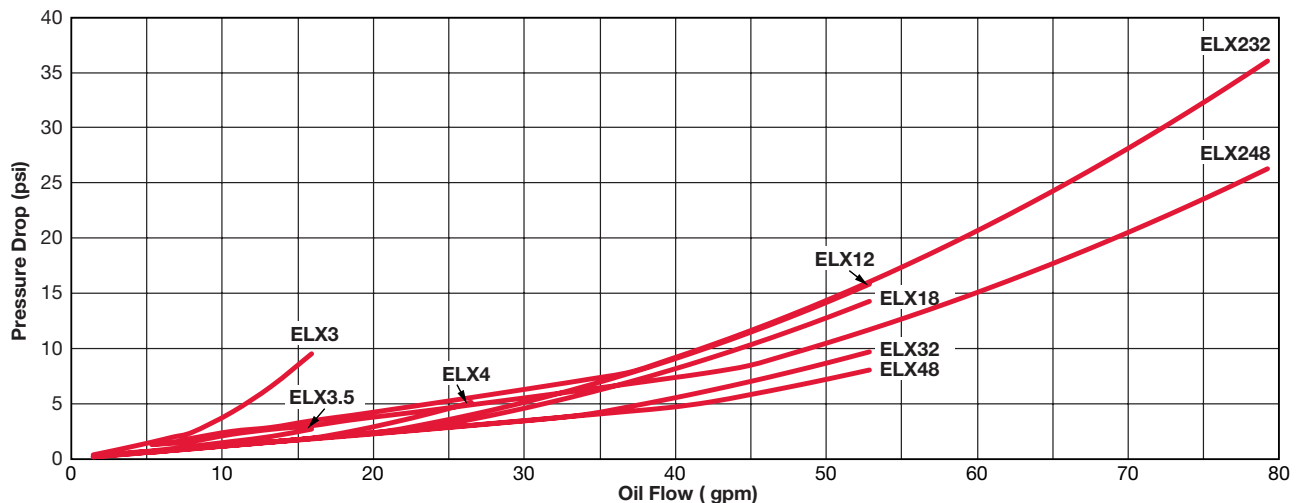


Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability

## Heat Dissipation, Models with DC Fans



## Pressure Drop

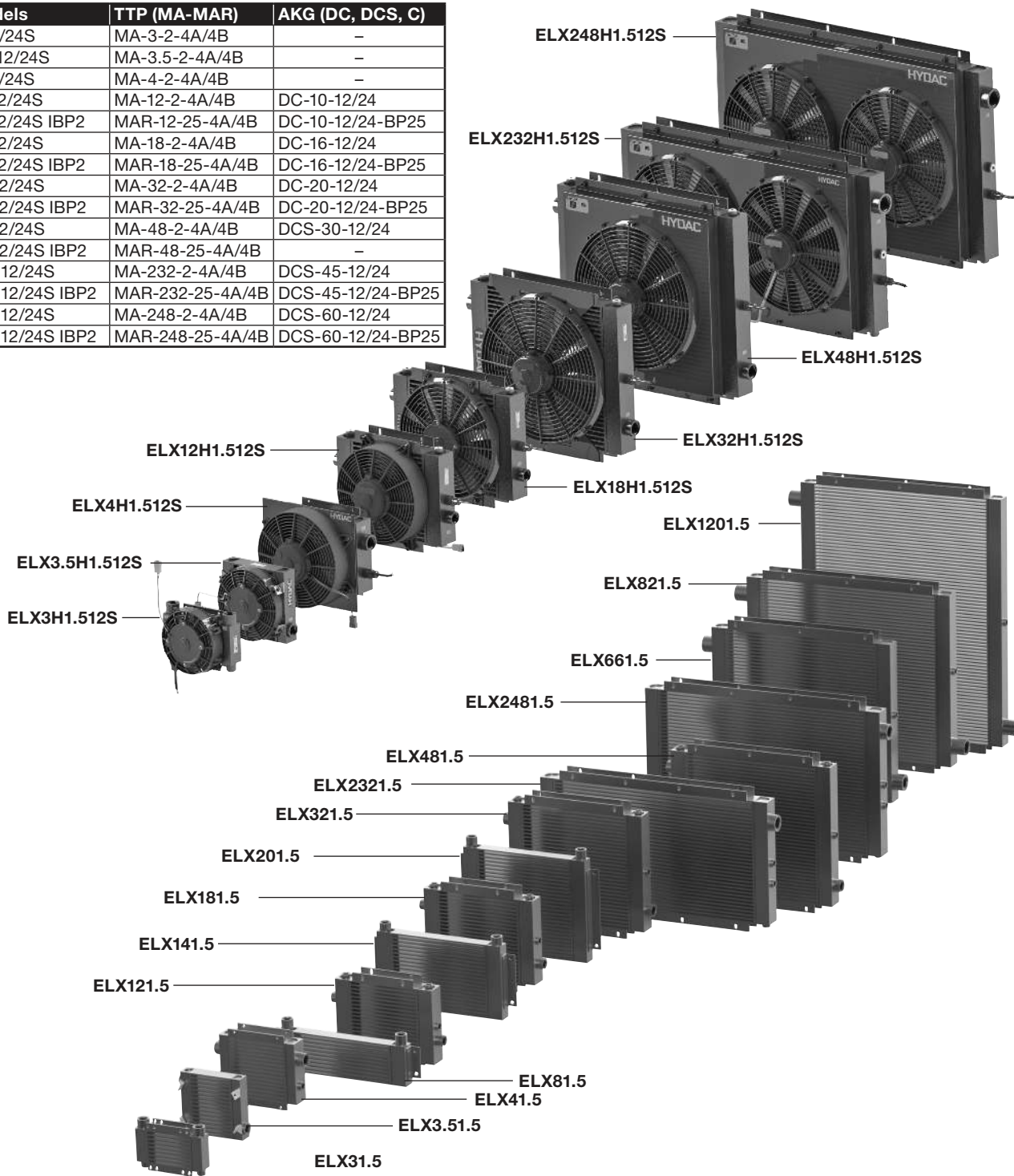


# MOBILE COOLERS

## ELX Visual Interchange Guide

### Models with Fans

HYDAC Models	TTP (MA-MAR)	AKG (DC, DCS, C)
ELX3H1.5 12/24S	MA-3-2-4A/4B	-
ELX3.5H1.5 12/24S	MA-3.5-2-4A/4B	-
ELX4H1.5 12/24S	MA-4-2-4A/4B	-
ELX12H1.5 12/24S	MA-12-2-4A/4B	DC-10-12/24
ELX12H1.5 12/24S IBP2	MAR-12-25-4A/4B	DC-10-12/24-BP25
ELX18H1.5 12/24S	MA-18-2-4A/4B	DC-16-12/24
ELX18H1.5 12/24S IBP2	MAR-18-25-4A/4B	DC-16-12/24-BP25
ELX32H1.5 12/24S	MA-32-2-4A/4B	DC-20-12/24
ELX32H1.5 12/24S IBP2	MAR-32-25-4A/4B	DC-20-12/24-BP25
ELX48H1.5 12/24S	MA-48-2-4A/4B	DCS-30-12/24
ELX48H1.5 12/24S IBP2	MAR-48-25-4A/4B	-
ELX232H1.5 12/24S	MA-232-2-4A/4B	DCS-45-12/24
ELX232H1.5 12/24S IBP2	MAR-232-25-4A/4B	DCS-45-12/24-BP25
ELX248H1.5 12/24S	MA-248-2-4A/4B	DCS-60-12/24
ELX248H1.5 12/24S IBP2	MAR-248-25-4A/4B	DCS-60-12/24-BP25



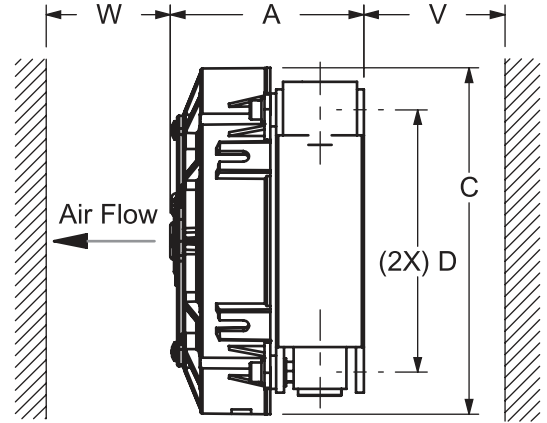
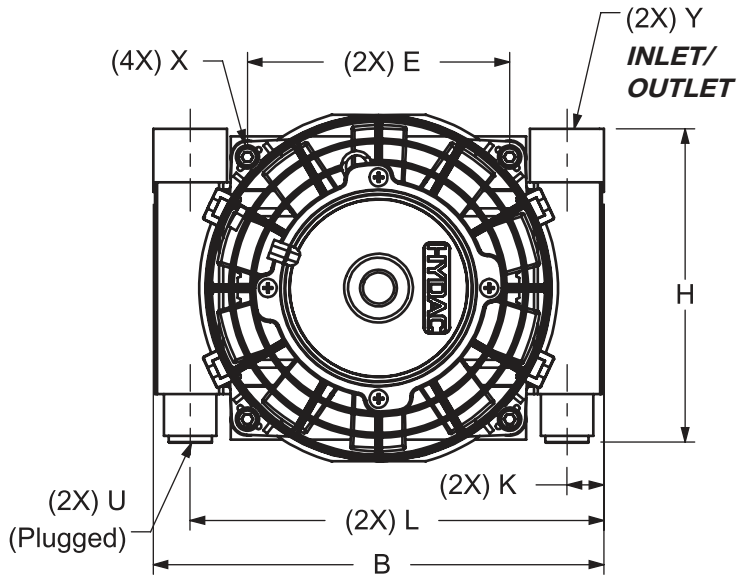
### Models without Fans

HYDAC Models	TTP (MA-MAR)	AKG (DC, DCS, C)
ELX31.5	MA-3-2	-
ELX3.51.5	MA-3.5-2	-
ELX41.5	MA-4-2	-
ELX81.5	MA-8-2	C-8
ELX121.5	MA-12-2	C-12
ELX121.5 IBP2	MAR-12-25-4A/4B	C-12-BP25
ELX141.5	MA-14-2	C-14
ELX181.5	MA-18-2	C-18
ELX181.5 IBP2	MAR-18-25-4A/4B	C-18-BP25
ELX201.5	MA-20-2	C-20
ELX321.5	MA-32-2	C-32
ELX321.5 IBP2	MAR-32-25-4A/4B	C-32-BP25

HYDAC Models	TTP (MA-MAR)	AKG (DC, DCS, C)
ELX481.5	MA-48-2	C-48
ELX481.5 IBP2	MAR-48-25-4A/4B	C-48-BP25
ELX661.5	MA-66-2	C-66
ELX661.5 IBP2	MAR-66-25-4A/4B	C-66-BP25
ELX821.5	MA-82-2	C-82
ELX821.5 IBP2	MAR-82-25-4A/4B	C-82-BP25
ELX1201.5	MA-120-2	C-120
ELX1201.5 IBP2	MAR-120-25-4A/4B	C-120-BP25
ELX2321.5	MA-232-2	-
ELX2321.5 IBP2	MAR-232-25-4A/4B	-
ELX2481.5	MA-248-2	-
ELX2481.5 IBP2	MAR-248-25-4A/4B	-

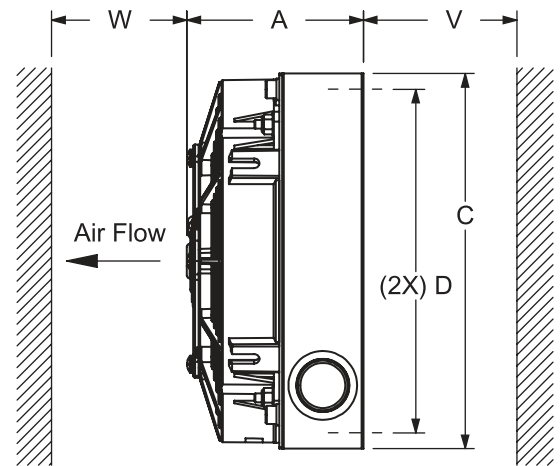
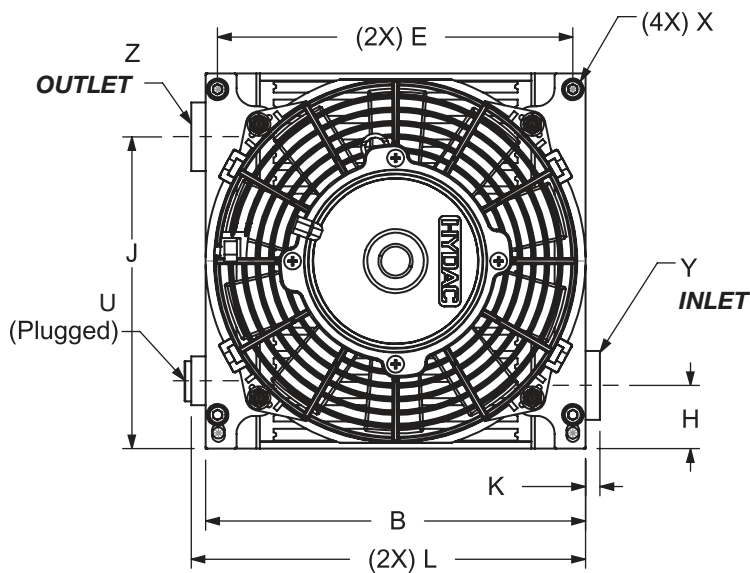
Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability

## Dimensions ELX Size 3



Size	A	B	C	D	E	F	H
3H	3.92 [100]	9.13 [232]	7.02 [178]	5.31 [135]	5.31 [135]	N/A	6.35 [161]
Size	J	K	L	U	V	W	Y/Z
3H	N/A	0.75 [19]	8.39 [213]	SAE-8	3.94 [100]	7.84 [200]	SAE-12

## Dimensions ELX Size 3.5

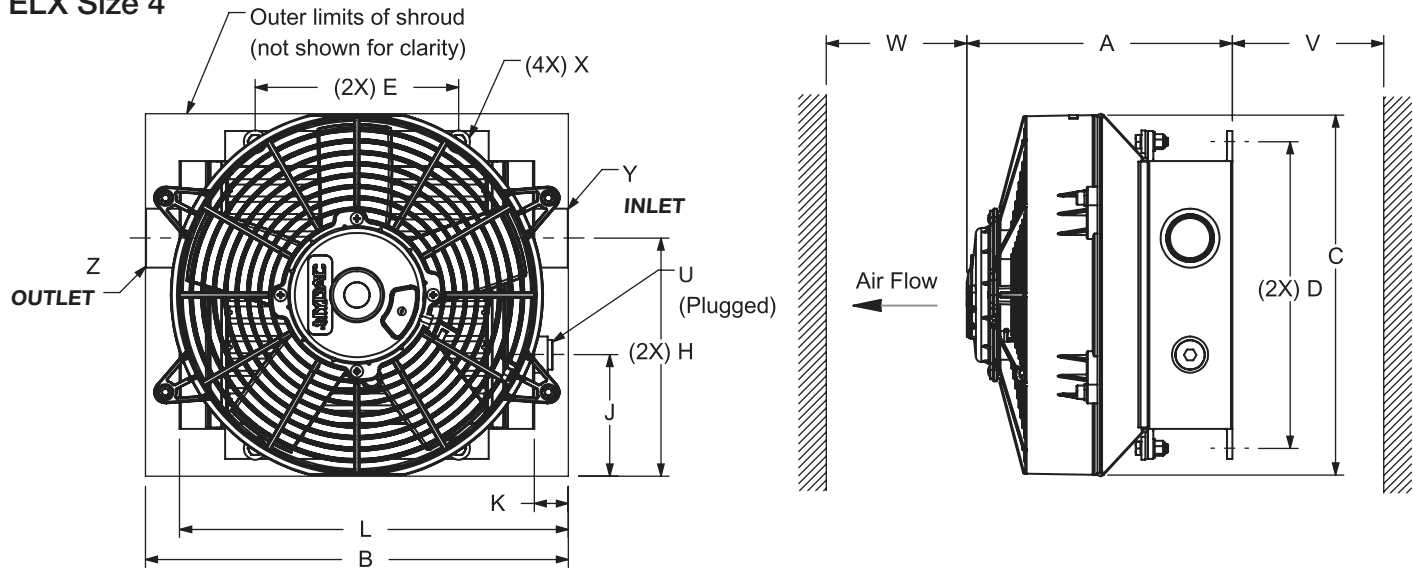


Size	A	B	C	D	E	F	H
3.5 H	3.84 [98]	8.27 [210]	8.17 [208]	7.48 [190]	7.73 [196]	N/A	1.38 [35]
Size	J	K	L	U	V	W	Y/Z
3.5 H	6.79 [173]	0.31 [8]	8.72 [222]	SAE-8	3.94 [100]	7.84 [200]	SAE-12

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

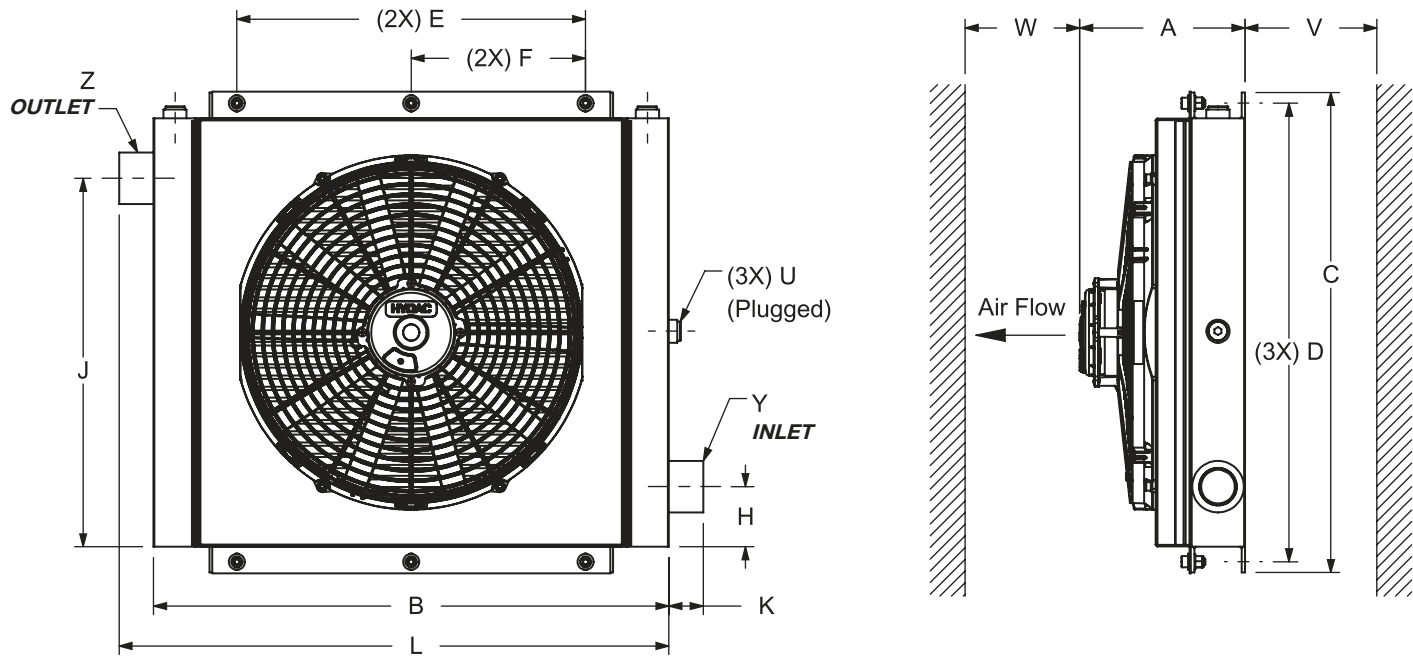
# MOBILE COOLERS

## Dimensions ELX Size 4



Size	A	B	C	D	E	F	H
4 H	7.80 [198]	12.44 [316]	10.59 [269]	9.02 [229]	5.98 [152]	N/A	7.00 [178]
Size	J	K	L	U	V	W	Y/Z
4H	3.58 [91]	1.00 [25]	11.43 [290]	SAE-8	5.12 [130]	10.24 [260]	SAE-16

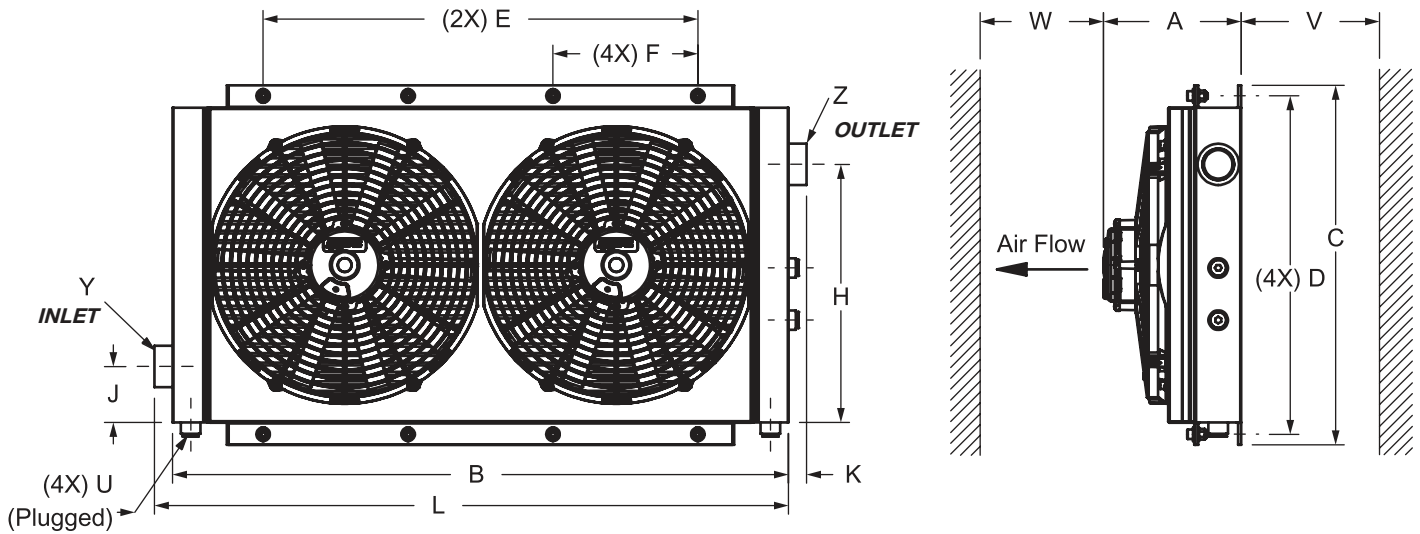
## Dimensions ELX Size 12 - 48



Size	A	B	C	D	E	F	H
12 H	6.38 [162]	13.78 [350]	12.13 [308]	11.06 [281]	5.71 [145]	N/A	3.03 [77]
18 H	5.03 [128]	15.75 [400]	13.82 [351]	12.83 [326]	5.87 [149]	N/A	2.72 [69]
32 H	6.06 [154]	19.69 [500]	18.46 [469]	17.32 [440]	12.00 [305]	N/A	2.85 [72]
48 H	7.58 [192]	23.62 [600]	22.00 [559]	21.02 [534]	15.98 [406]	8.00 [203]	2.76 [70]
Size	J	K	L	U	V	W	Y/Z
12 H	6.89 [175]	1.00 [25]	14.76 [375]	SAE-8	5.12 [130]	10.24 [260]	SAE-12
18 H	8.74 [222]	1.00 [25]	16.73 [425]	SAE-8	5.91 [150]	11.81 [300]	SAE-12
32 H	13.21 [336]	1.57 [40]	21.26 [540]	SAE-8	7.87 [200]	15.75 [400]	SAE-20
48 H	16.89 [429]	1.57 [40]	25.20 [640]	SAE-8	7.87 [200]	15.75 [400]	SAE-20

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

## Dimensions ELX Size 232 - 248



Size	A	B	C	D	E	F	H
232 H	7.48 [190]	33.46 [850]	19.53 [496]	18.39 [467]	23.62 [600]	7.87 [200]	14.02 [356]
248 H	7.48 [190]	35.43 [900]	23.23 [590]	22.20 [564]	26.57 [675]	8.86 [225]	17.70 [450]

Size	J	K	L	U	V	W	Y/Z
232 H	3.03 [77]	1.00 [25]	34.45 [875]	SAE-8	6.89 [175]	13.78 [350]	SAE-20
248 H	2.74 [70]	1.00 [25]	36.42 [925]	SAE-8	6.89 [175]	13.78 [350]	SAE-20

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





## **C** Air Cooled Oil Coolers for Industrial Applications

These coolers use a combination of high performance cooling elements, and long life AC fan drives to give extended, trouble-free operation in the most demanding of industrial cooling applications. Available with radial, or axial air flow; e-fans or industry standard NEMA motors; single-phase, or three-phase power. There is a product available for every application.

# INDUSTRIAL COOLERS

## OKC Series

AC E-Fans



### 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 115/230/480 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

### Applications



Gearboxes



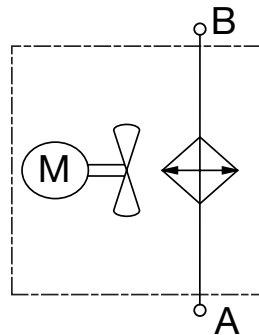
Industrial



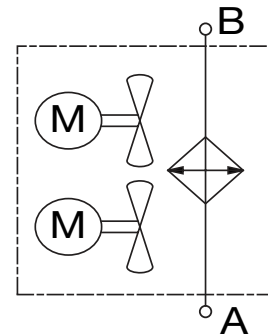
Power Generation

### Hydraulic Symbol

Sizes 0 - 5



Sizes 6 - 7



### General

<b>Materials</b>	Housing: welded steel Heat exchanger: aluminum, brazed bar-and-plate Fan: steel
<b>Mounting Orientation</b>	All positions
<b>Max. Operating Pressure</b>	230 psi (16 bar)
<b>Fluids</b>	Mineral oil to DIN 51524 Part 1 and 2 (contact factory for other fluid usages)
<b>Ambient Temperature</b>	50° – 104°F (10° – 40°C)
<b>Max. Oil Temp.</b>	266°F (130°C)
<b>Std. 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

## Model Code

	<b>OKC</b>	<b>1H</b>	<b>1.5</b>	<b>115</b>	<b>S</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>Model</b>	_____								
OKC	= Air Cooled Oil Cooler with AC Motor Drive								
<b>Size</b>	_____								
0H, 1H, 2H, 3H, 4S, 5S, 6H, 7S									
(Note: H = 3600 RPM, S = 1800 RPM)									
<b>Version Number</b>	_____								
<b>Motor Drive Voltage</b>	_____								
115	= 115 Volts 50/60 Hz, 1ph								
230	= 230 Volts 50/60 Hz, 1ph								
480	= 480 Volts 60 Hz, 3ph								
<b>Air Flow Direction</b>	_____								
S	= Suction (through heat exchanger, exhausting through fan)								
<b>Accessories</b>	_____								
IBT	= Internal Temperature Bypass Valve								
IBP	= Internal Pressure Bypass Valve								
<b>Opening Temperature (IBT only)</b>	_____								
45	= 113°F (45°C) (closes at 131°F)								
50	= 130°F (50°C) (closes at 150°F)								
60	= 140°F (60°C) (closes at 158°F)								
<b>Opening Pressure (IBT &amp; IBP)</b>	_____								
2	= 29 psi (2 bar)								
3	= 45 psi (3 bar)								
4	= 58 psi (4 bar)								
<b>Temperature Switch</b>	_____								
(omit)	= None								
TS-120	= Inline Switch, Fixed 120°F								
TS-140	= Inline Switch, Fixed 140°F								
TS-160	= Inline Switch, Fixed 160°F								

*Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability*

Preferred OKC Models	P/N
OKC1H1.5115S QS	2594668
OKC1H1.5480S SC	2592532
OKC2H1.5115S QS	2594560
OKC2H1.5480S SC	2592534
OKC3H1.5480S SC	2592536
OKC4S1.5115S QS	2594336
OKC4S1.5480S SC	2592538
OKC5S1.5230S SC	2592539
OKC6H1.5480S SC	2592542
OKC7S1.5480S SC	2592544

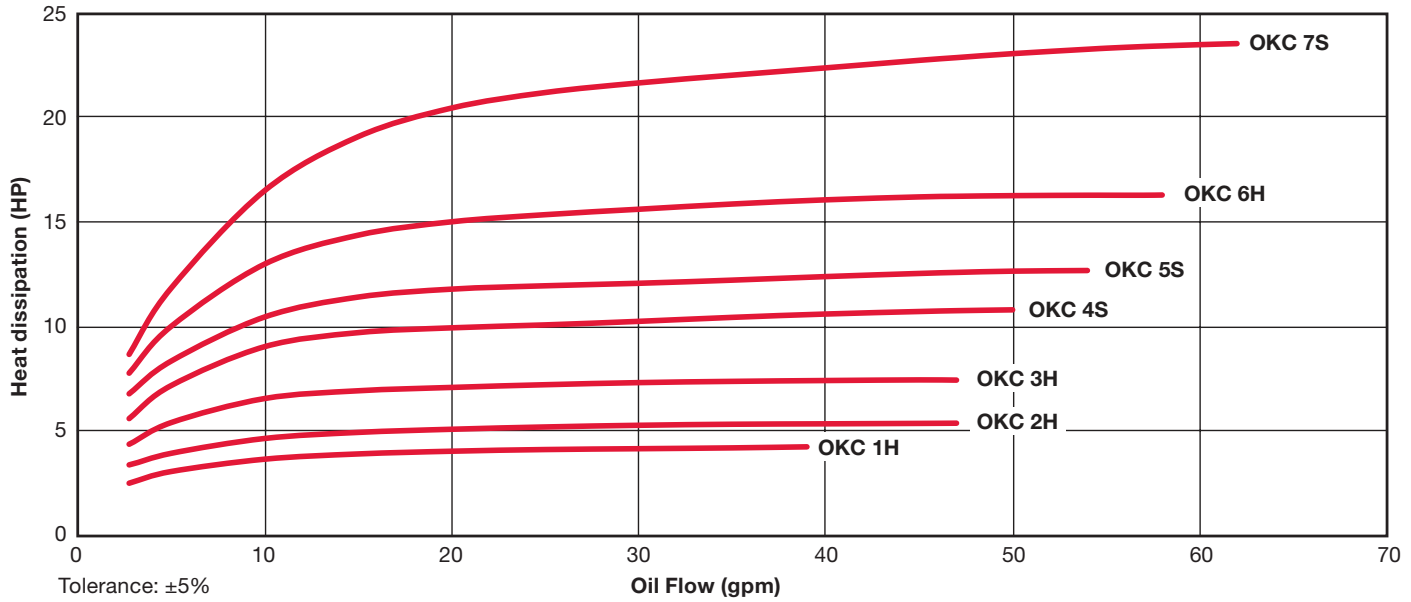
## Technical Specifications

Size	Current Draw (amps)	Speed @ 60Hz (rpm)	Fan Diameter (mm) / (in)	Noise Level dBa* (1 Meter)	Weight (lbs.)
	115V / 230V / 480V	115V / 230V / 480V			
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.

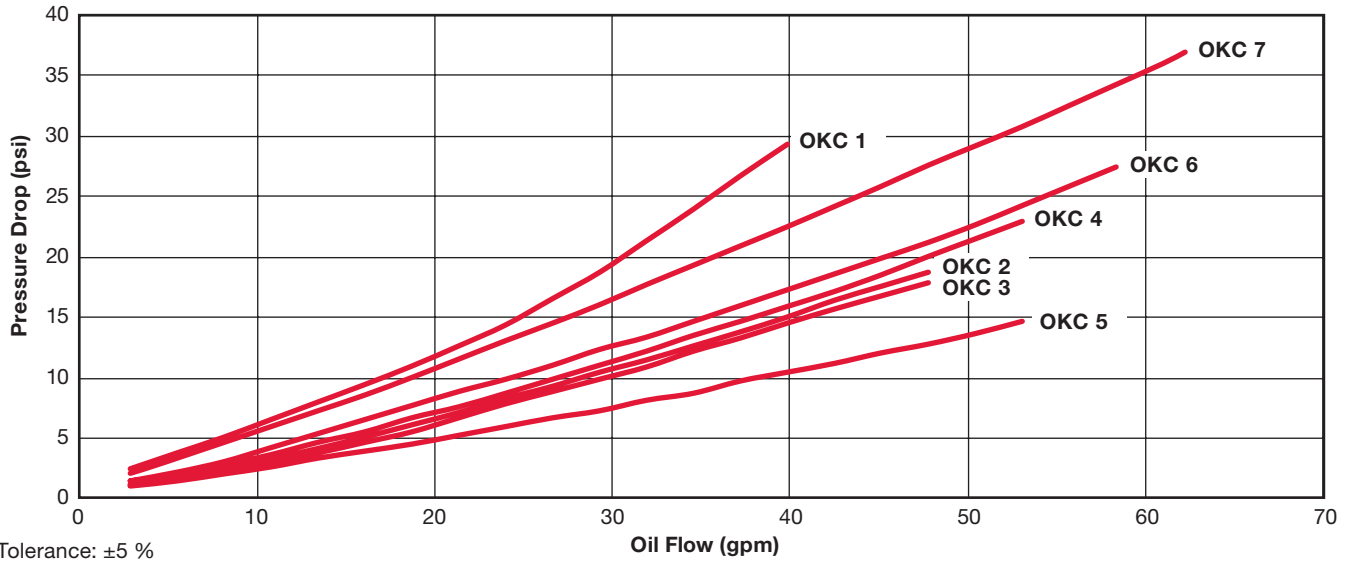
# INDUSTRIAL COOLERS

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



Cooling capacity is dependent on the oil flow rate and the temperature difference  $\Delta T$  between oil inlet and air inlet.

## Pressure Drop @ 30cSt

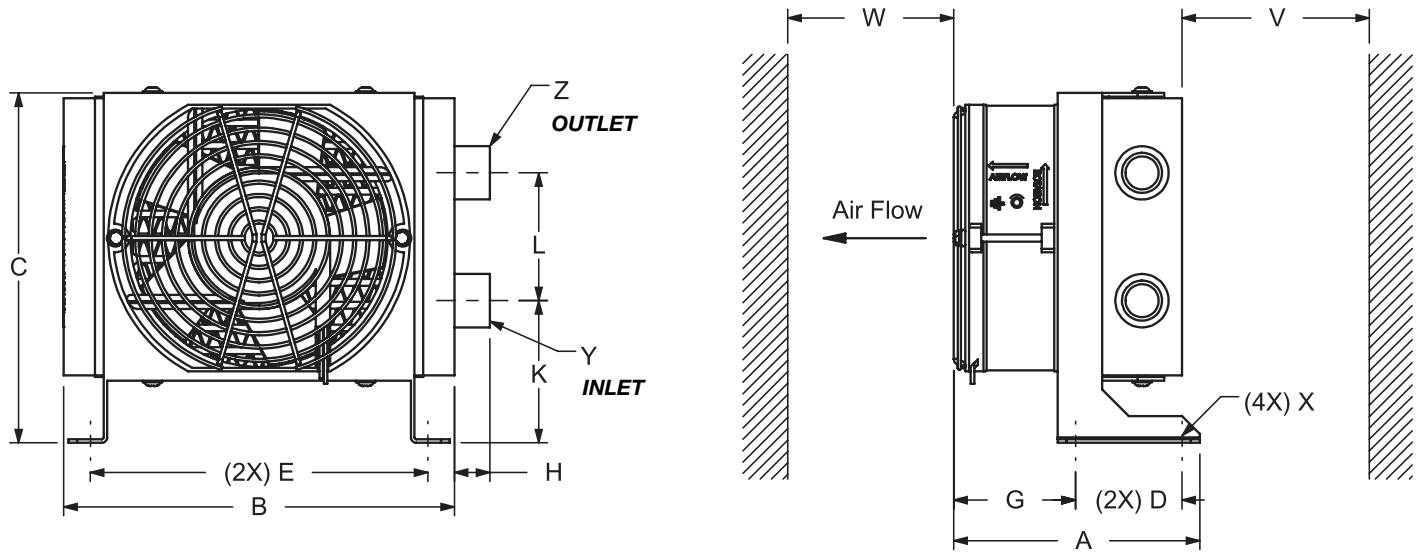


Pressure differential  $\Delta p$  depending on flow rate  $Q$  and the viscosity of the oil. For other viscosities the result must be multiplied by the K factors below.

## K Factor Chart

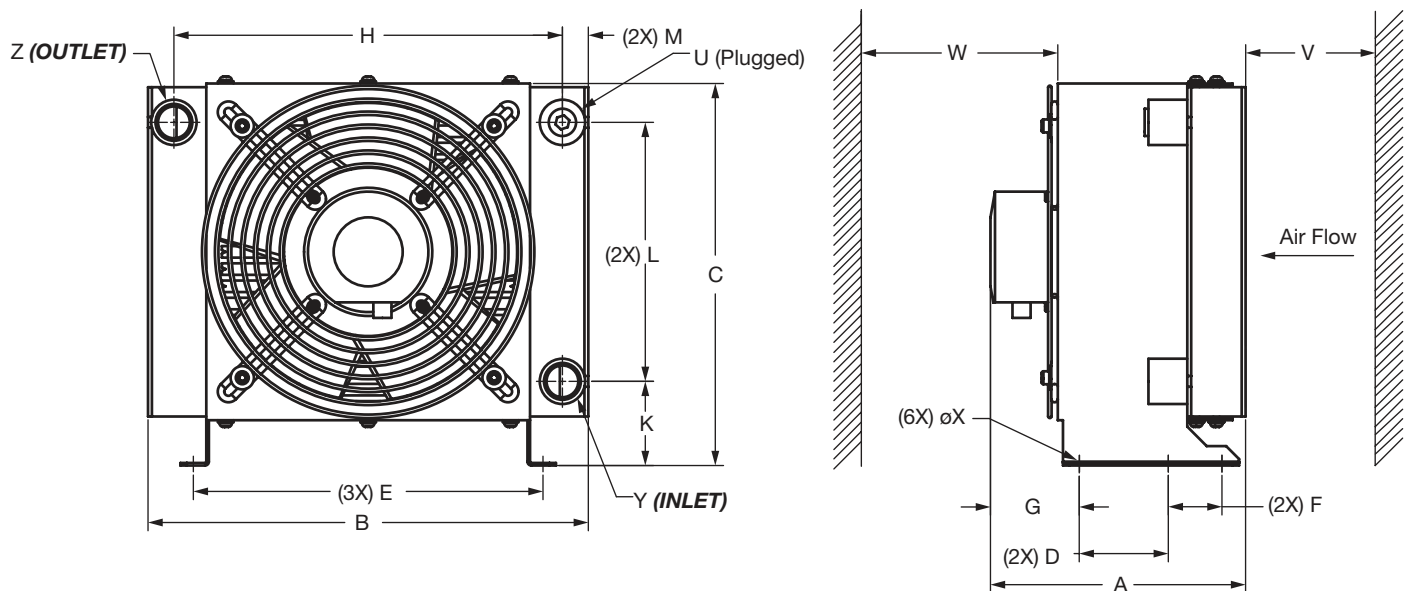
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3
Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150

## Dimensions OKC Size 0



Size	A	B	C	D	E	F	G	H	K	L	M	V	W	U	X	Y	Z
0	5.31 [135]	8.66 [220]	7.87 [200]	2.36 [60]	7.48 [190]	N/A	3.15 [80]	9.45 [240]	3.11 [79]	2.83 [72]	N/A	3.94 [100]	3.94 [100]	N/A	ø0.28 [ø7]	G 1/2"	G 1/2"

## Dimensions OKC Size 1



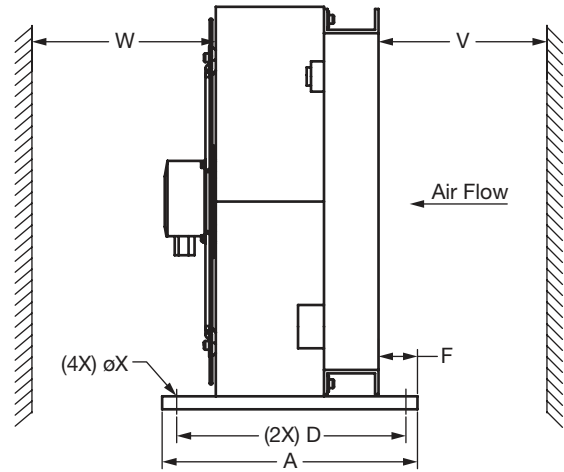
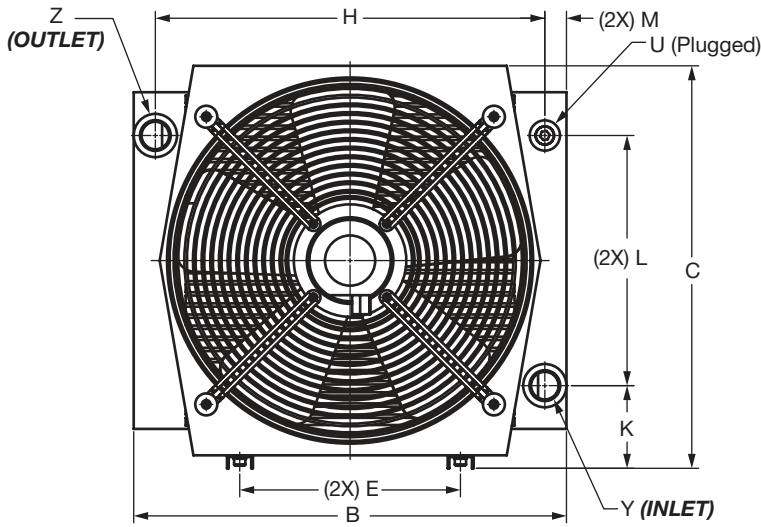
Size	A	B	C	D	E	F	G	H	K	L	M	V	W	U	X	Y	Z
1	7.76 [197]	13.39 [340]	11.61 [295]	1.97 [50]	10.63 [270]	2.36 [60]	2.64 [67]	11.81 [300]	2.56 [65]	7.87 [200]	0.79 [20]	2.76 [70]	7.87 [200]	1/2" NPT	ø0.33 [ø8]	SAE-12	SAE-12

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

# INDUSTRIAL COOLERS

## Dimensions

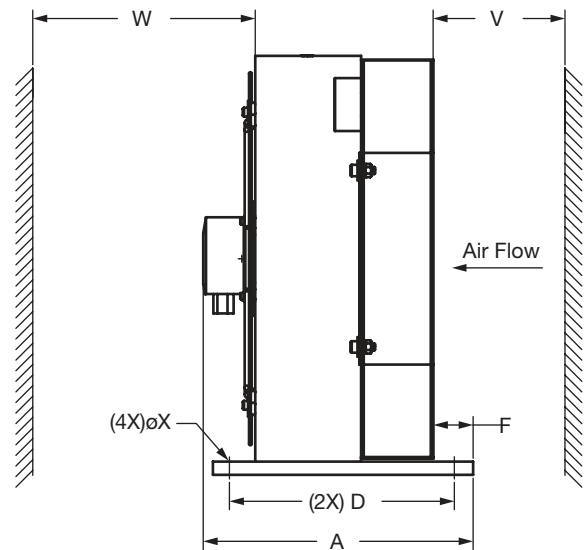
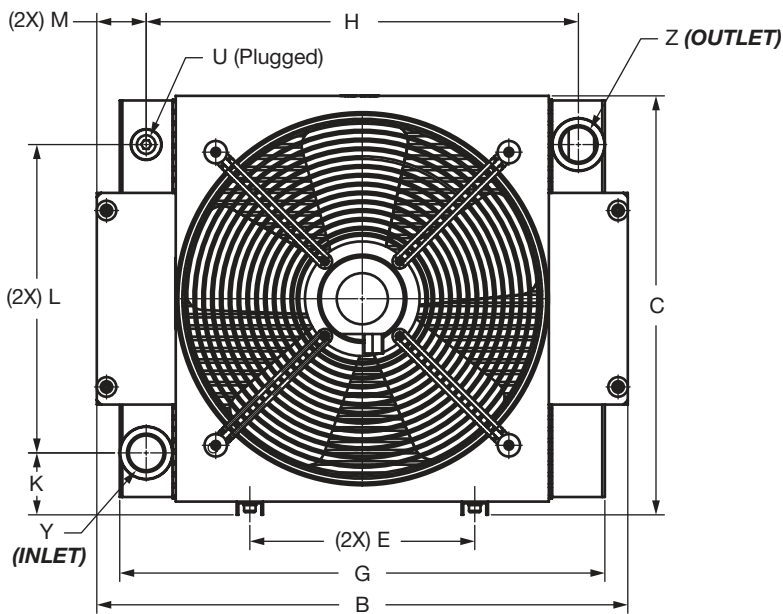
### OKC Size 2 - 4



Size	A	B	C	D	E	F	G	H	K	L	M	V	W	U	X	Y	Z
2	11.61 [295]	15.12 [384]	12.91 [328]	10.04 [255]	6.30 [160]	2.95 [75]	N/A	12.76 [324]	2.76 [70]	7.87 [200]	1.18 [30]	5.91 [150]	9.84 [250]	1/2" NPT	ø0.35 [ø9]	SAE-16	SAE-16
3	11.61 [295]	16.54 [420]	14.61 [371]	10.04 [255]	9.54 [242]	2.17 [55]	N/A	14.57 [370]	3.09 [78]	9.06 [230]	0.98 [25]	7.09 [180]	11.81 [300]	1/2" NPT	ø0.35 [ø9]	SAE-16	SAE-16
4	11.61 [295]	19.69 [500]	18.31 [465]	10.04 [255]	10.04 [255]	1.77 [45]	N/A	17.72 [450]	3.76 [95]	11.39 [289]	0.98 [25]	7.87 [200]	15.75 [400]	1/2" NPT	ø0.35 [ø9]	SAE-16	SAE-16

## Dimensions

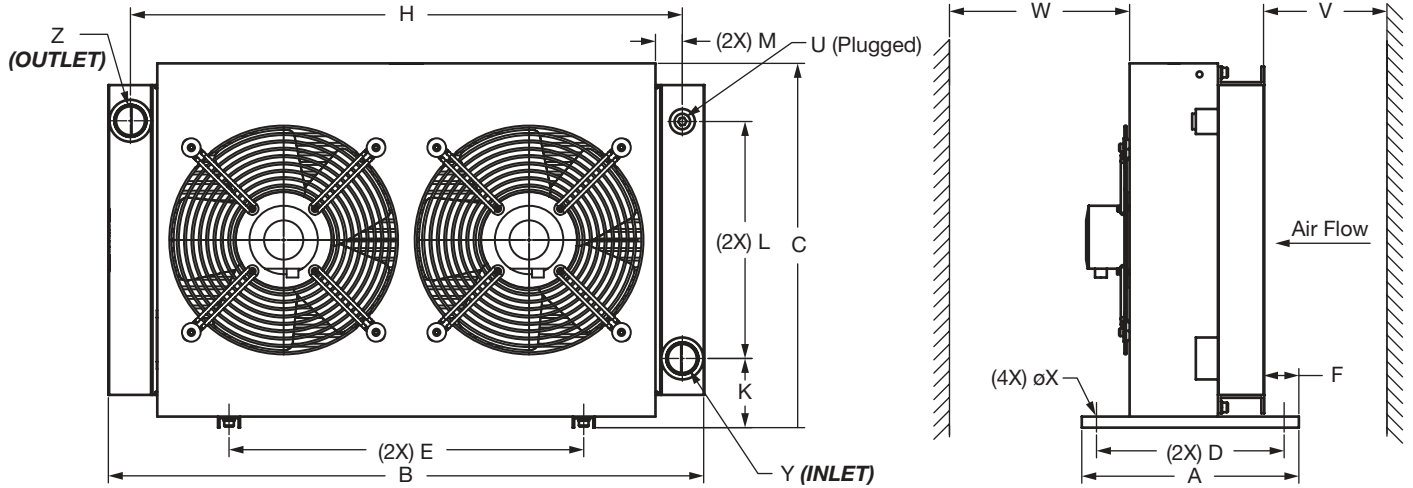
### OKC Size 5



Size	A	B	C	D	E	F	G	H	K	L	M	V	W	U	X	Y	Z
5	12.05 [306]	23.70 [602]	18.70 [475]	10.04 [255]	10.04 [255]	N/A	21.65 [550]	19.30 [490]	2.76 [70]	13.76 [350]	2.20 [56]	N/A	N/A	1/2" NPT	ø0.35 [ø9]	SAE-20	SAE-20

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

## Dimensions OKC Size 6 - 7



Size	A	B	C	D	E	F	G	H	K	L	M	V	W	U	X	Y	Z
6	11.61 [295]	31.89 [810]	19.49 [495]	10.04 [255]	18.98 [482]	1.85 [47]	N/A	29.53 [750]	3.70 [94]	12.68 [322]	1.18 [30]	7.78 [198]	15.75 [400]	1/2" NPT	ø0.35 [ø9]	SAE-20	SAE-20
7	11.61 [295]	37.40 [950]	21.54 [547]	10.04 [255]	18.98 [482]	1.85 [47]	N/A	35.04 [890]	3.70 [94]	14.69 [373]	1.18 [30]	9.84 [250]	19.80 [503]	1/2" NPT	ø0.35 [ø9]	SAE-20	SAE-20

# INDUSTRIAL COOLERS

## OK Series - AC Motor Drive

Air Cooled Oil Coolers



### Features

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

- Up to 50 HP cooling capacity
- Highly efficient and rugged 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.
- Packaged systems with pump flows ranging from 8.45 gpm to 47.5 gpm

### Applications



Gearboxes



Industrial



Elevators



Power Generation



Pulp & Paper



Railways



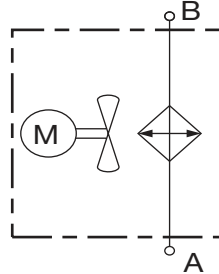
Shipbuilding



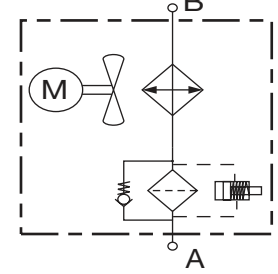
Steel / Heavy Industry

### Hydraulic Symbol

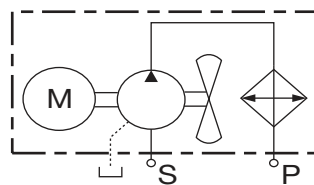
OK Sizes 2 - 7



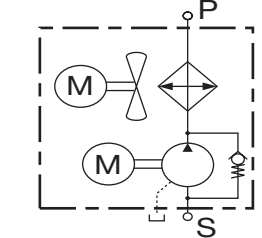
OKF Sizes 3 - 7



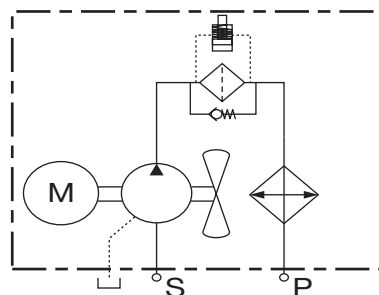
OKA Sizes 4 - 6



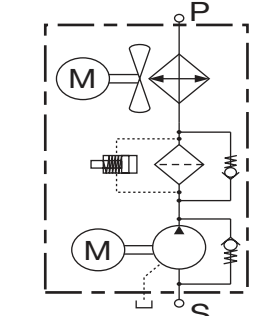
OKA Size 7



OKAF Sizes 4 - 6



OKAF Size 7





## General

<b>Materials</b>	Housing: Welded Steel Heat Exchanger: Aluminum Heavy Duty Bar and Plate Fan: Plastic Motor: TEFC, NEMA or IEC frame ( <i>varies by cooler size</i> ) Pump: 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) ( <i>Contact factory for other fluid usages</i> )
<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.

## Technical Specifications

Model	Set up	Max. Oil Flow Rate (gpm)	Pump Displacement - Flow Rate	Noise (dBa @ 1 m)	Motor Specifications		
					Fan (HP)	Pump (HP)	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

# INDUSTRIAL COOLERS

## Model Code

**OKA 4L 3.6 B 28 MF95 3 B IBP 2 TS120**

### Model

- OK = Basic Cooler
- OKF = Cooler with Filter (*Sizes 3-7 only*)
- OKA = Cooler with Pump (*Sizes 4-7 only*)
- OKAF = Cooler with Pump & Filter (*Sizes 4-7 only*)

### Size

- 2H, 2S, 3H, 3S, 4L, 4S, 5L, 5S, 6L, 6S, 7L, 7S
- (Note: H = 3600 RPM, S = 1800 RPM, L = 1200 RPM)

### Modification Number (*latest version supplied*)

### Motor Voltage

- B = 230/460 Volts, 3ph
- C = 575 Volts, 3ph
- X = No Motor

### Pump

- (omit) = No Pump
- 28 = 28 ccm/rev, L=8.4 gpm, S=12.75 gpm (*sizes 4L, 4S, 5L, 5S, 6L, 6S only*)
- 40 = 40 ccm/rev, L=12 gpm, S=18.5 gpm (*sizes 4L, 4S, 5L, 5S, 6L, 6S only*)
- 70 = 70 ccm/rev, L/S=34.3 gpm (*sizes 7L & 7S only*)
- 100 = 100 ccm/rev, L/S=47.5 gpm (*sizes 7L & 7S only*)

### Filter Type

- (omit) = No Filter
- MF95 = Spin-On 25 rated gpm
- MF190 = Spin-On 30 rated gpm
- MF195 = Spin-On 60 rated gpm
- LPF160 = Cartridge Filter 43 rated gpm
- LPF240 = Cartridge Filter 63 rated gpm
- LPF280 = Cartridge Filter 73 rated gpm
- FLND250 = Duplex Filter 66 rated gpm (*sizes 4-7 only*)
- FLND400 = Duplex Filter 105 rated gpm (*size 7 only*)

### Micron Rating

- (omit) = No Filter
- 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*)

### Filter Indicator

- (omit) = No Filter
- B = Visual
- C = Electrical (AC/DC) (*LPF + FLND filters only*)
- D24 = 24 VDC Lamp/Switch (*LPF + FLND filters only*)
- D115 = 115 VAC Lamp/Switch (*LPF + FLND filters only*)
- D230 = 230 VAC Lamp/Switch (*LPF + FLND filters only*)

### Accessories

- (omit) = None
- IBT = Internal Temperature Bypass Valve
- IBP = Internal Pressure Bypass Valve

### Opening Temperature (*IBT Only*)

- 45 = Opens 113°F (45°C) Closes at 131°F (55°C)
- 50 = Opens 130°F (50°C) Closes at 150°F (65°C)
- 60 = Opens 140°F (60°C) Closes at 158°F (70°C)

### Opening Pressure (*IBT & IBP*)

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

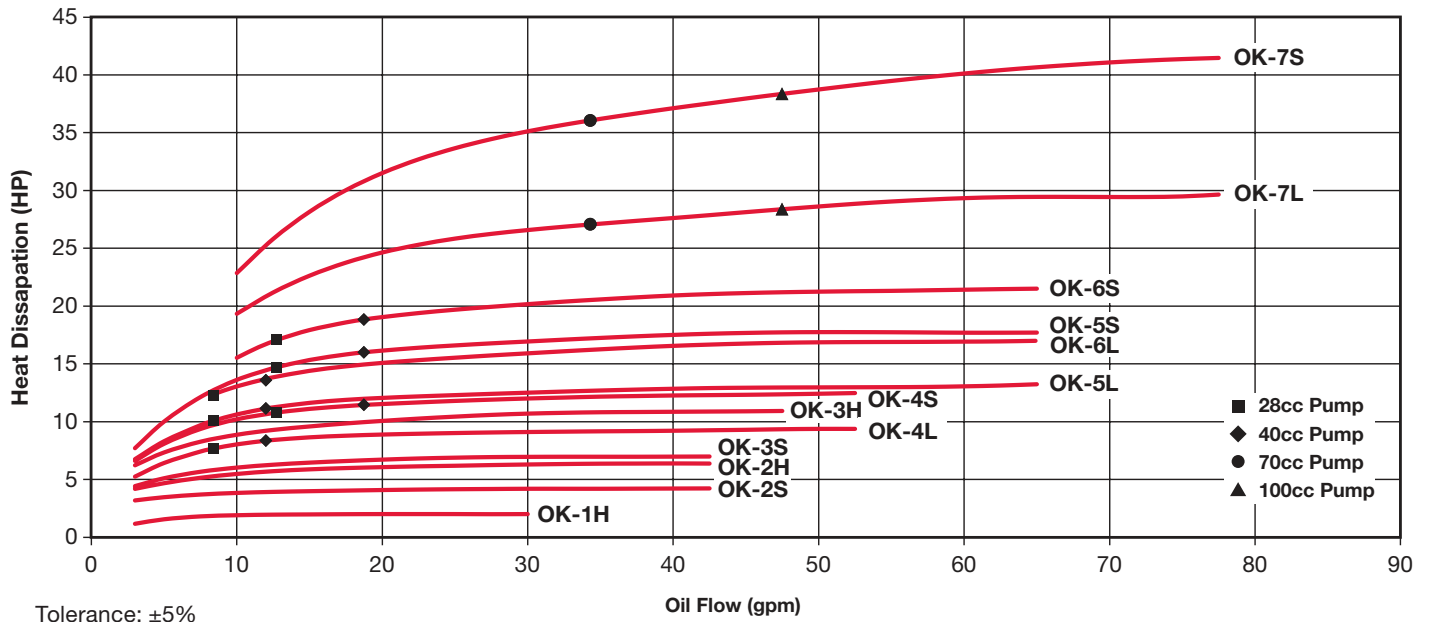
### Temperature Switch

- TR1 = Reservoir Thermostat, adjustable 32° to 200°F (*must be ordered as a separate line item*)
  - AITR = Inline Thermostat, adjustable 32°F to 200°F
  - TS-120 = Inline Temperature Switch, Fixed 120°F
  - TS-140 = Inline Temperature Switch, Fixed 140°F
  - TS-160 = Inline Temperature Switch, Fixed 160°F
- (TS switches OK and OKF models only)

Preferred OK Models	P/N
OK2S3.5B SC	2594320
OK3H3.5B QS	2592814
OK2S3.5B SC	2598092
OK5S3.6B QS	2598094
OK6S3.6B QS	2598096
OK7S3.6B SC	2597679

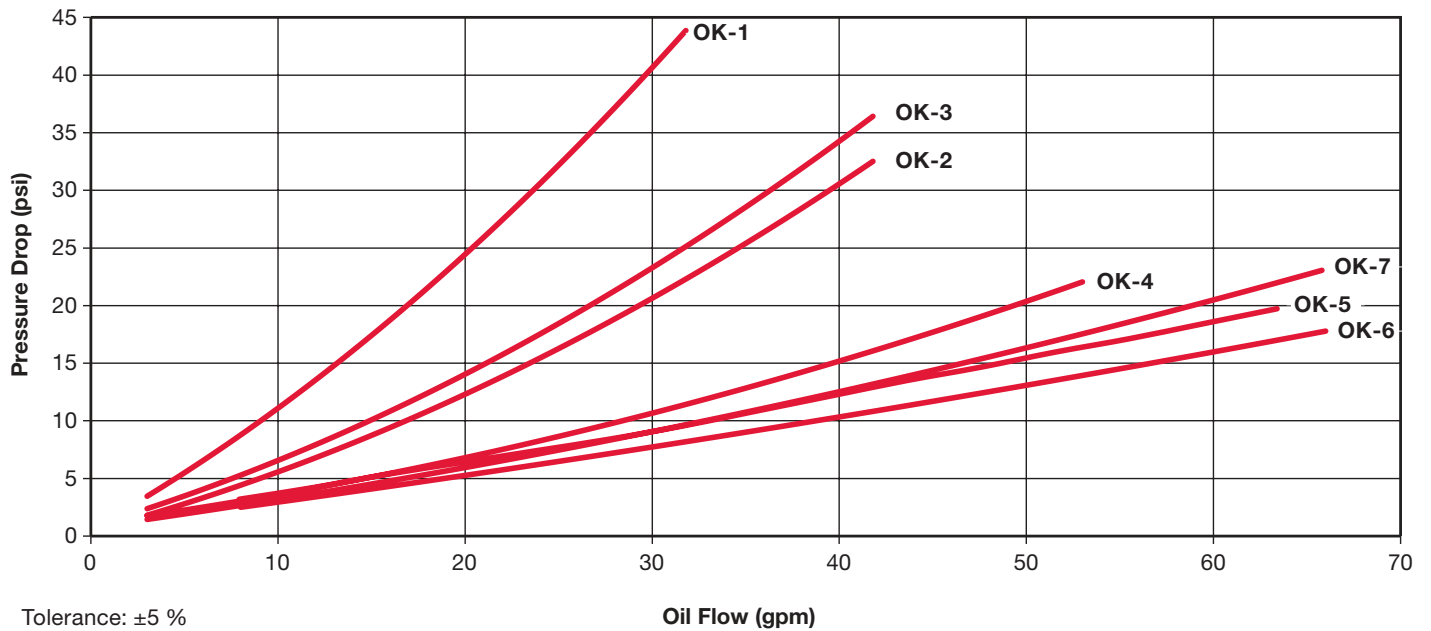
Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability

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



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

## Pressure Drop @ 30cSt



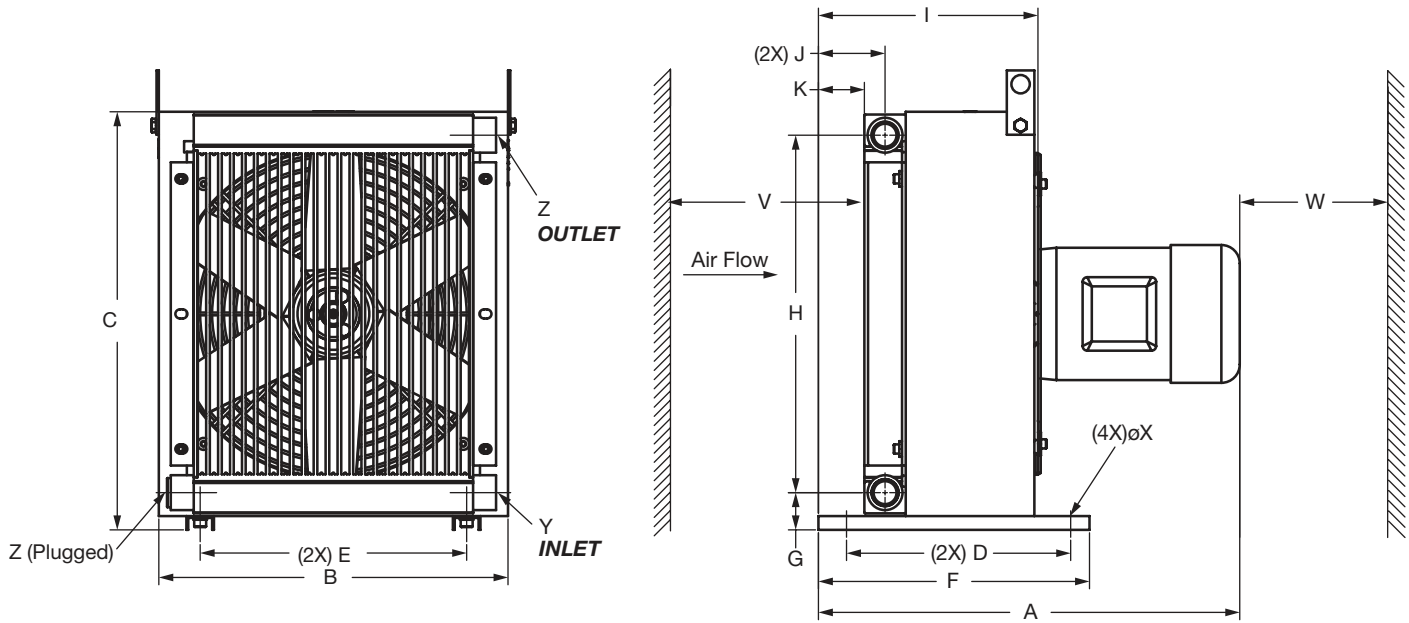
For other viscosities the result must be multiplied by the K factors below

## K Factor Chart

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

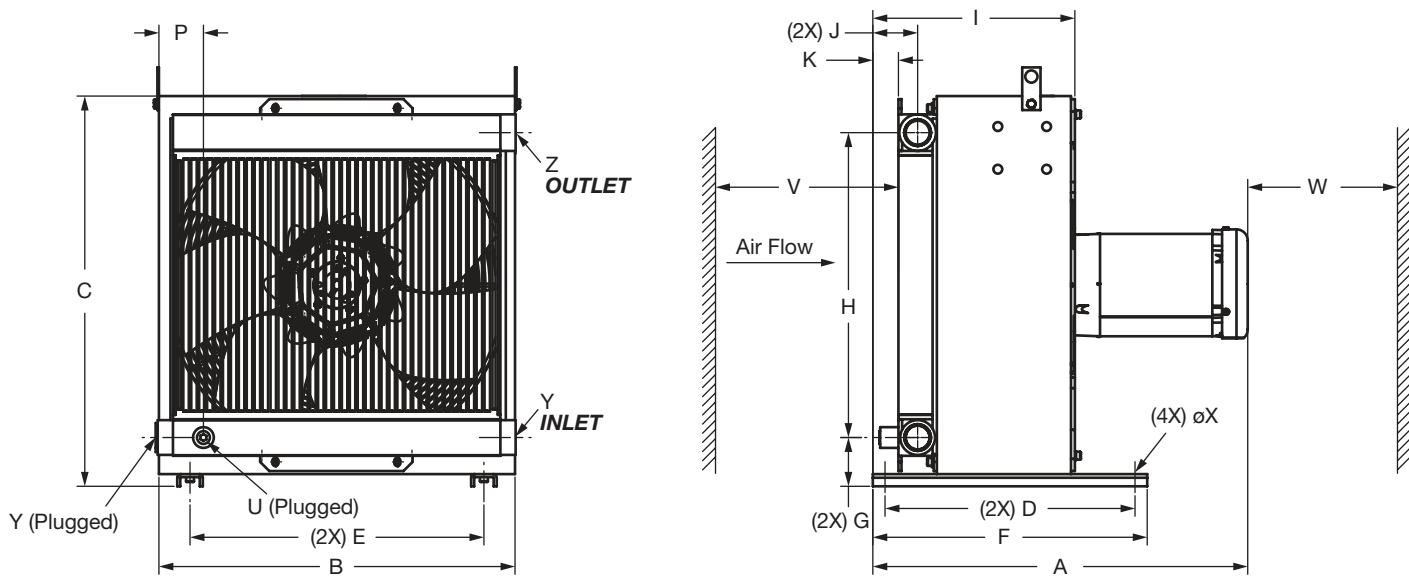
# INDUSTRIAL COOLERS

## Dimensions OK 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	SAE-12	SAE-12
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	SAE-12	SAE-12

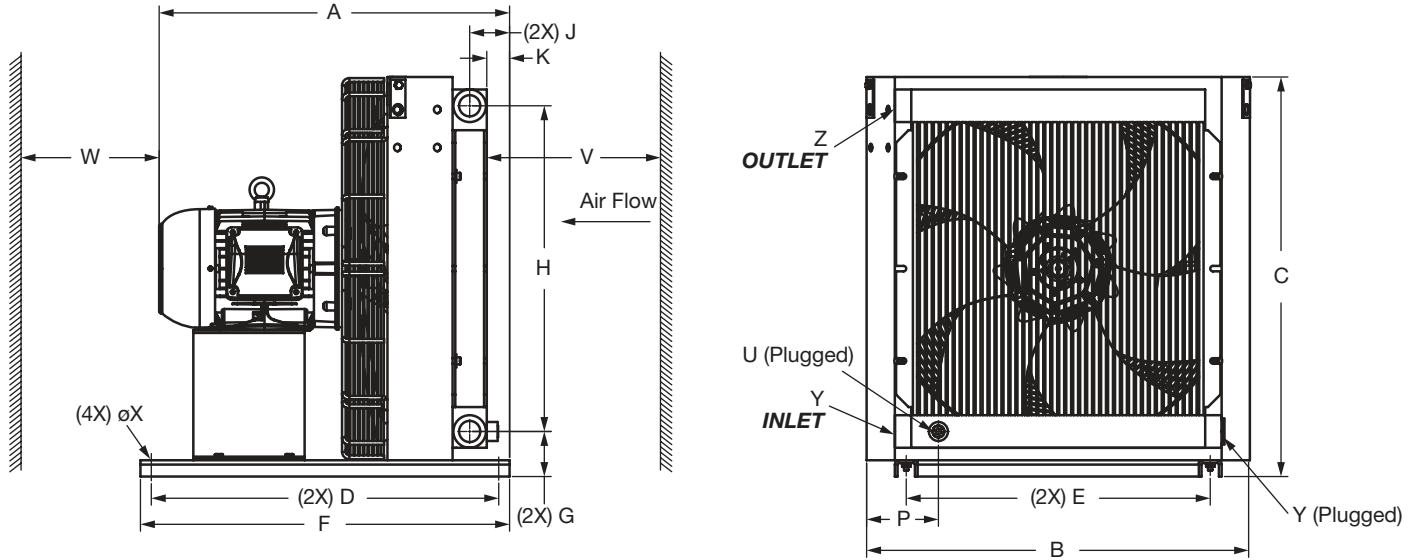
## Dimensions OK Size 4 - 6



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	ø0.35 x 0.78 slot	SAE-16	SAE-16
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	ø0.35 x 0.78 slot	SAE-16	SAE-16
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	ø0.35 x 0.78 slot	SAE-20	SAE-20

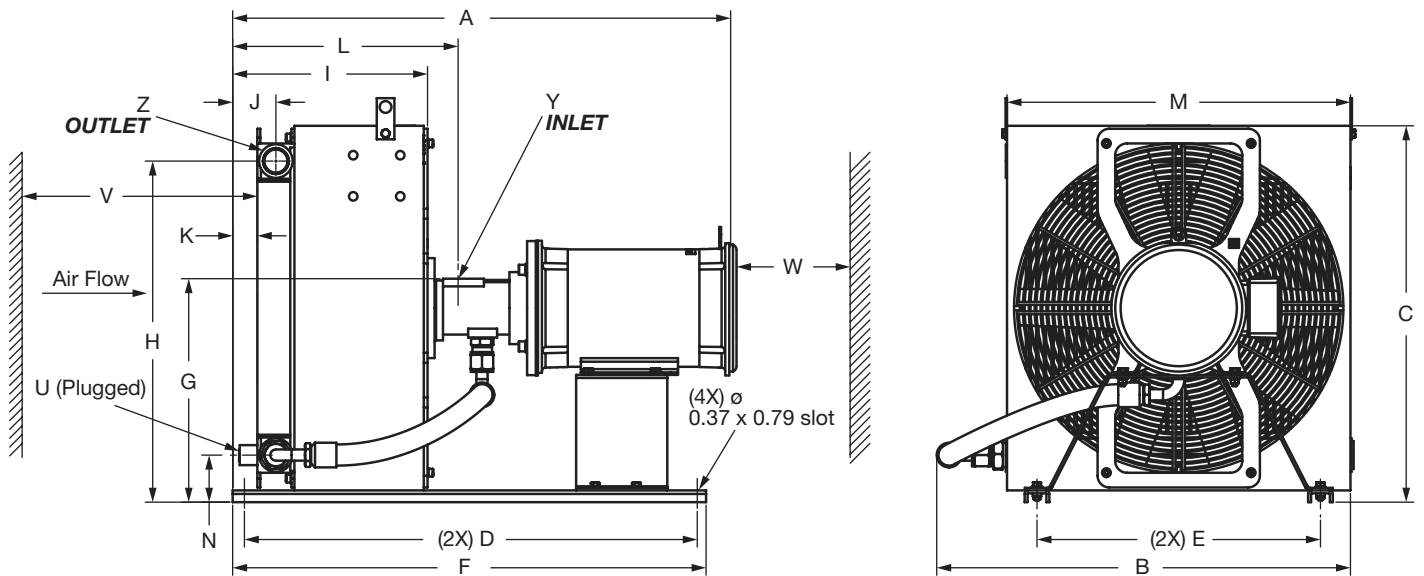
Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

## Dimensions OK 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	ø0.35 x 0.78 Slot	SAE-20	SAE-20

## Dimensions OKA Size 4 - 6

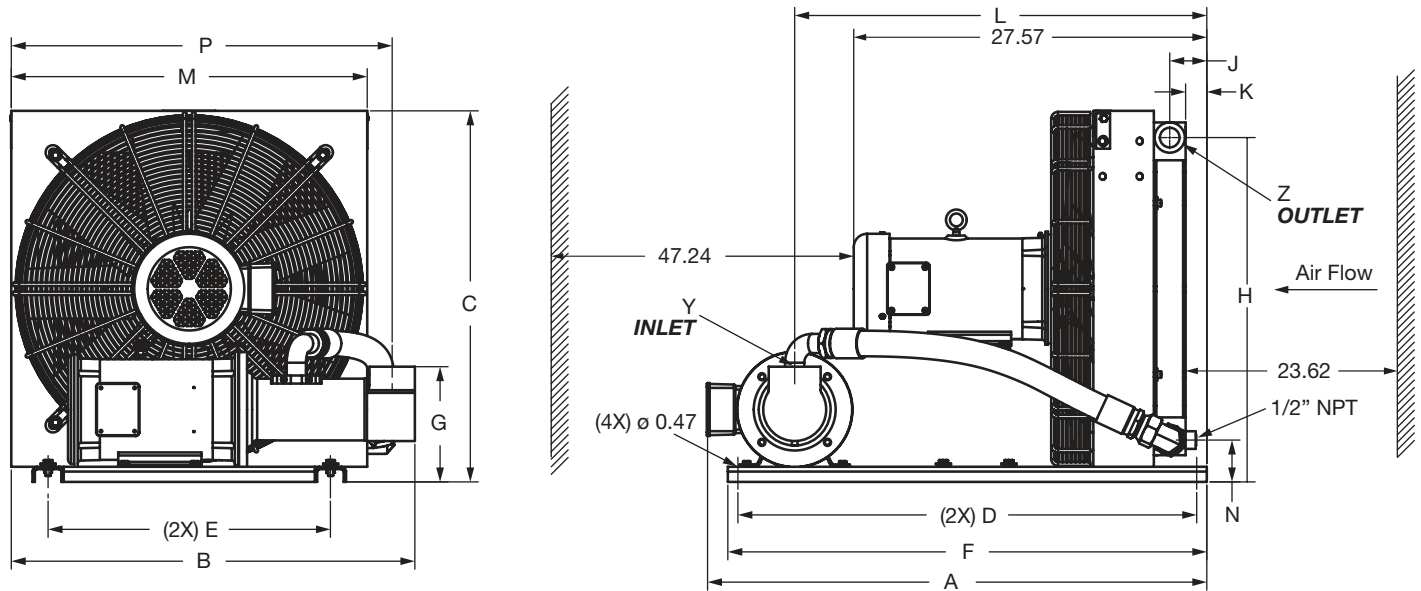


Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	U	V	W	Y	Z
OKA4L SB28	32.67	22.50	20.47	30.31	16.73	31.69	12.60	19.27	11.61	4.07	2.83	13.91	19.09	-	-	15.75	47.24	SAE-16	SAE-16
OKA4L SB40	34.41	22.50	20.47	30.31	16.73	31.69	13.39	19.27	11.61	4.07	2.83	14.44	19.09	-	-	15.75	47.24	SAE-24	SAE-16
OKA5L SB28	30.55	25.16	22.13	27.95	18.98	30.32	13.43	20.12	9.82	1.24	2.44	11.86	21.34	-	-	19.69	59.06	SAE-16	SAE-16
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	SAE-24	SAE-16
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	SAE-16	SAE-20
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	SAE-24	SAE-20

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

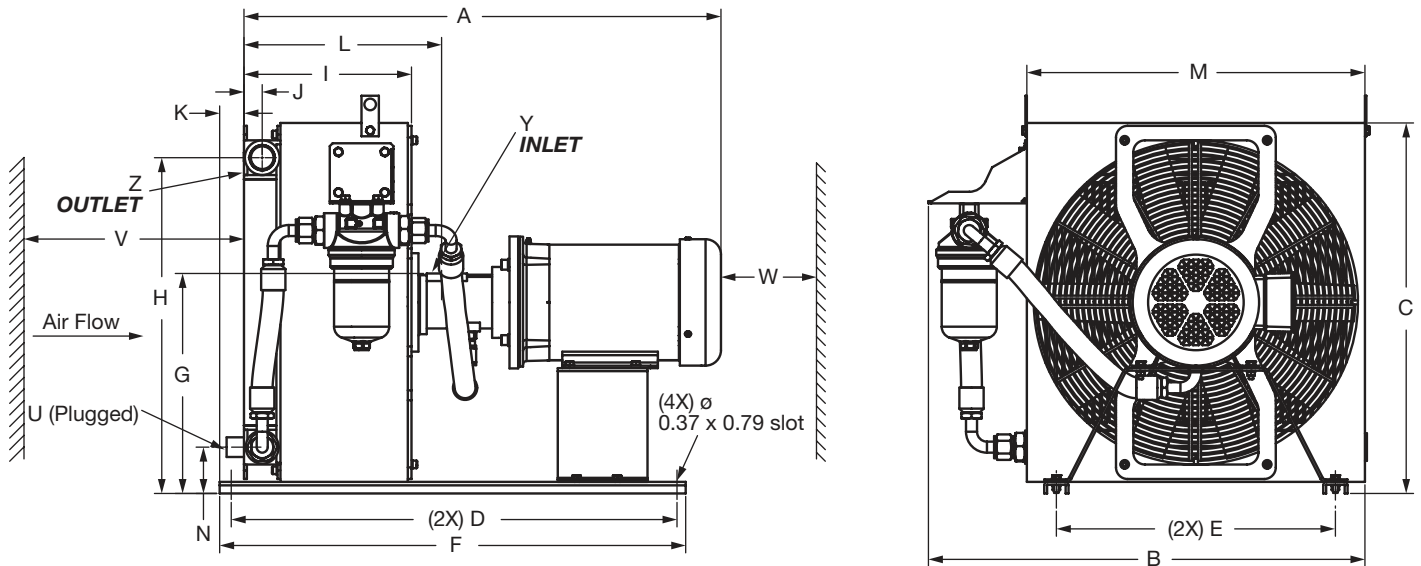
# INDUSTRIAL COOLERS

## Dimensions OKA 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	SAE-20
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	SAE-20

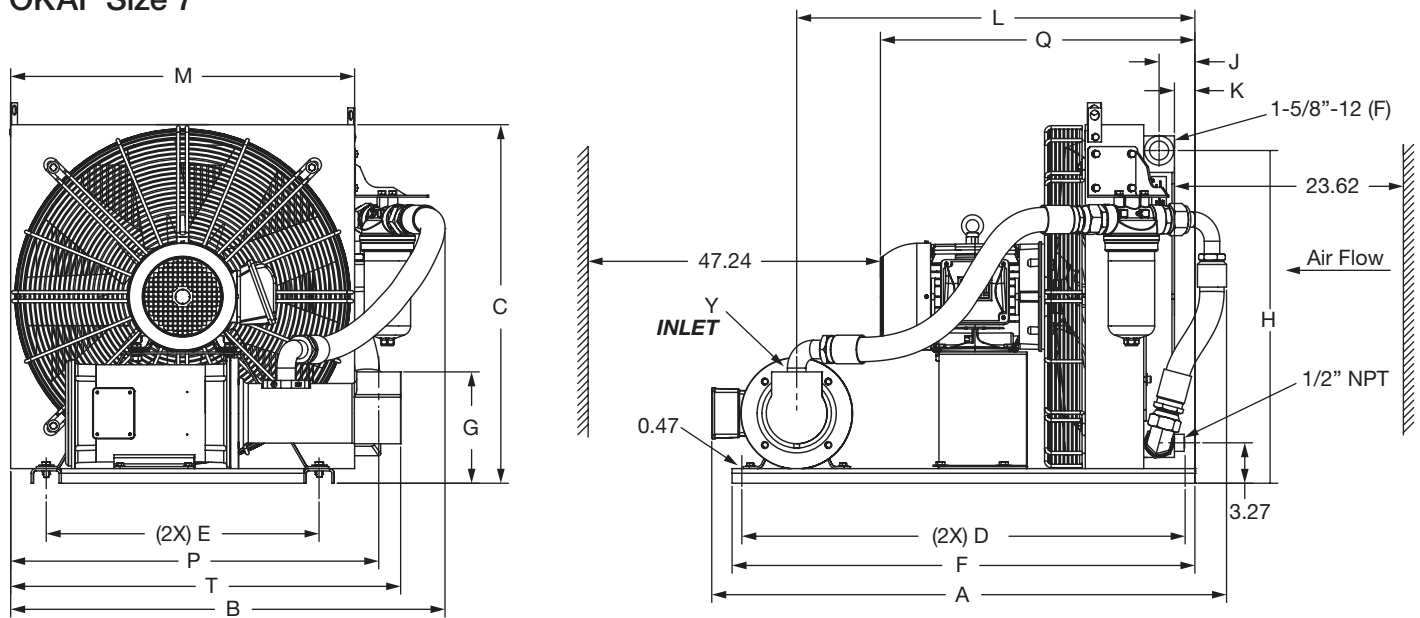
## Dimensions OKAF Size 4 - 6



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	SAE-16	SAE-16
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	SAE-24	SAE-16
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	SAE-16	SAE-16
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	SAE-24	SAE-16
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	SAE-16	SAE-20
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	SAE-24	SAE-20

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

## Dimensions OKAF 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.

# INDUSTRIAL COOLERS

## OK LN Series - AC Motor Drive

Air Cooled Oil Coolers



### Features

The OK-LN is the optimized, low noise version of the OK series coolers. They are available in sizes 8-14 and have flexible adaptation to various applications to cool industrial hydraulic applications.

- Up to 200 HP cooling capacity
- Highly efficient and rugged 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.
- 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



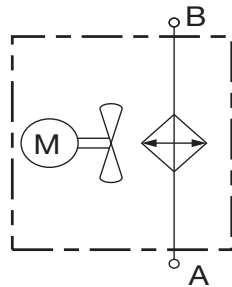
Shipbuilding



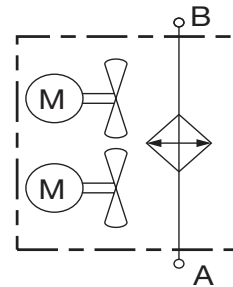
Steel / Heavy Industry

### Hydraulic Symbol

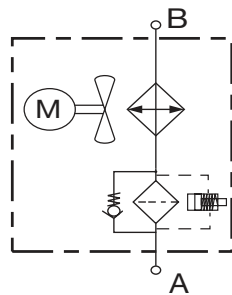
OK LN Sizes 8 - 11



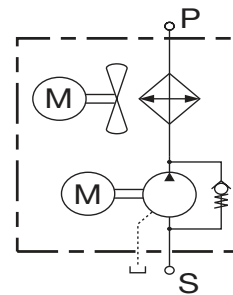
OK - LN Sizes 12 - 14



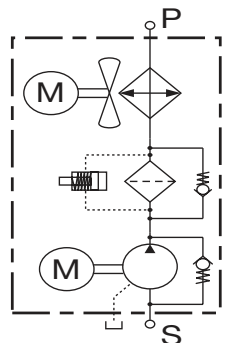
OKF LN Sizes 8 - 11



OKA LN Size 8 - 11



OKAF LN Sizes 8 - 11





## Low Noise Solution

### Product Development

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

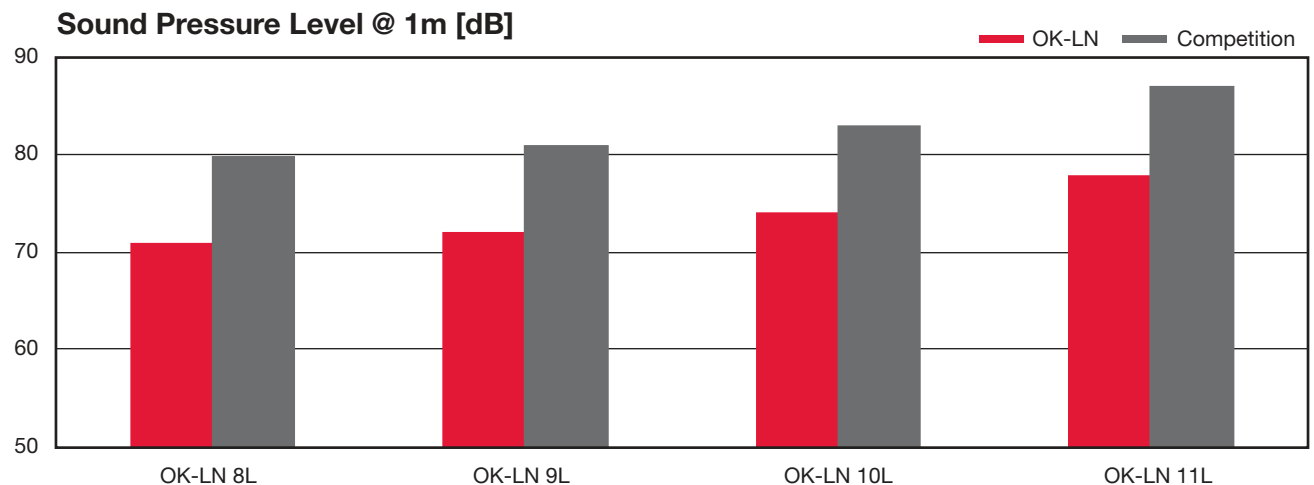
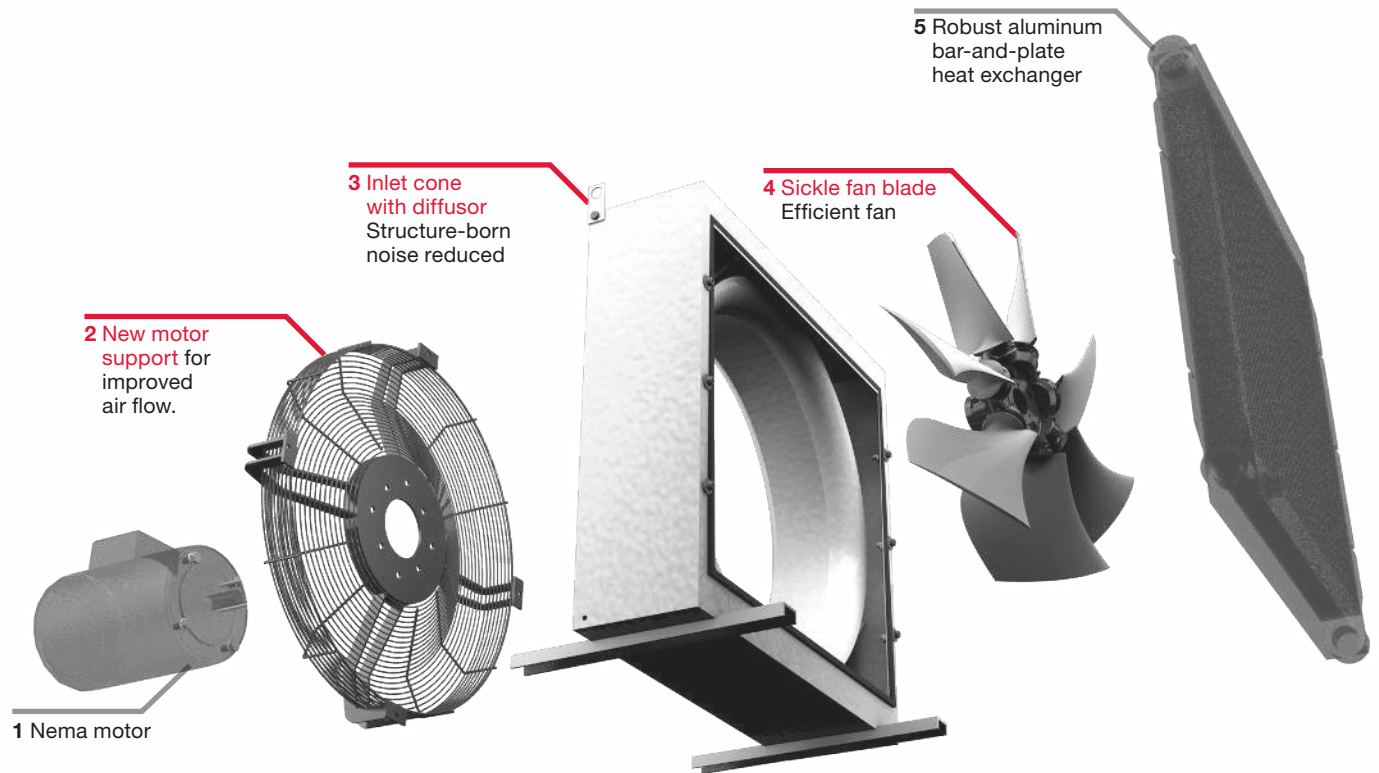
The new OK-LN cooler product line can be used in most industrial applications, where oil or a water-glycol mixture must be cooled using forced air. Typical applications include hydraulic circuits of industrial power units, gearboxes, tool-machines, transformers and others.

### 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 - average of 10 dB lower than competitor unit
- High heat dissipation
- Low electric current consumption



# INDUSTRIAL COOLERS

## General

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

## Technical Specifications

Model	Set up	Max. Oil Flow Rate (gpm)	Pump Displacement - Flow Rate			Noise (dBa @ 1 m)	Motor Specifications		
			Fan (HP)	Pump (HP)	RPM				
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		1200
OK-LN 14S	Fan	220				TBD	(2x) 7.5		1800

## Model Code

**OKAF-LN 10L 3.6 B 70 LPF240 3 B IBP 2 TS140**

### Model

- OK- LN = Basic Cooler
- OKF- LN = Cooler with Filter (sizes 8-11 only)
- OKA- LN = Cooler with Pump (sizes 8-11 only)
- OKAF- LN = Cooler with Pump & Filter (sizes 8-11 only)

### Size

- 8L, 8S, 9L, 10L, 10S, 11L, 11S, **12L, 14L, 14S**
- (Note: S = 1800 RPM, L = 1200 RPM)

### Modification Number (latest version supplied)

### Motor Voltage

- B = 230/460 Volts, 3ph
- C = 575 Volts, 3ph**
- X = No Motor

### Pump

- (omit) = No Pump
- 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

### Filter Type

- (omit) = No Filter
- MF195 = Spin-On 60 rated gpm
- LPF240 = Cartridge Filter 63 rated gpm**
- LPF280 = Cartridge Filter 73 rated gpm**
- FLND250 = Duplex Filter 66 rated gpm**
- FLND400 = Duplex Filter 105 rated gpm**

### Micron Rating

- (omit) = No Filter
- 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)**

### Filter Indicator

- (omit) = No Filter
- B = Visual
- C = Electrical (AC/DC) (LPF + FLND filters only)**
- D24 = 24 VDC Lamp/Switch (LPF + FLND filters only)**
- D115 = 115 VAC Lamp/Switch (LPF + FLND filters only)**
- D230 = 230 VAC Lamp/Switch (LPF + FLND filters only)**

### Accessories

- (omit) = None
- IBT = Internal Temperature Bypass Valve
- IBP = Internal Pressure Bypass Valve

### Opening Temperature (IBT Only)

- 45 = Opens 113°F (45°C) Closes at 131°F (55°C)
- 50 = Opens 130°F (50°C) Closes at 150°F (65°C)
- 60 = Opens 140°F (60°C) Closes at 158°F (70°C)

### Opening Pressure (IBT & IBP)

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

### Temperature Switch

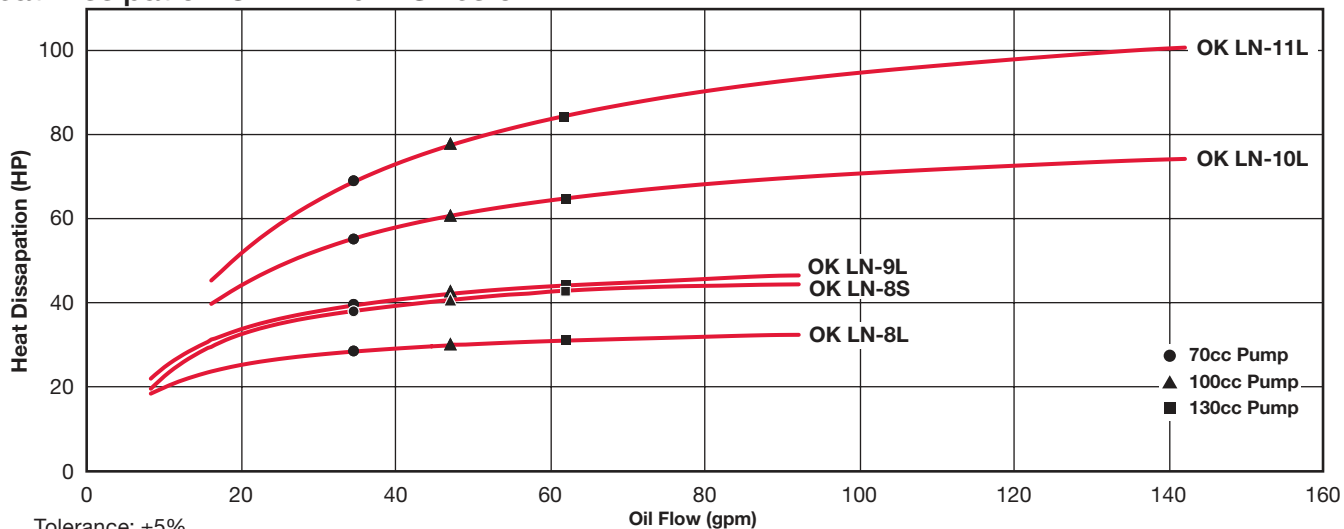
- TR1 = Reservoir Thermostat, adjustable 32° to 200°F (must be ordered as a separate line item)
  - AITR = Inline Thermostat, adjustable 32°F to 200°F
  - TS-120 = Inline Temperature Switch, Fixed 120°F
  - TS-140 = Inline Temperature Switch, Fixed 140°F
  - TS-160 = Inline Temperature Switch, Fixed 160°F
- (TS switches OK and OKF models only)

Preferred OK-LN Models	P/N
OK-LN8S3.6B QS	2597967
OK-LN8L3.6B SC	2597966
OK-LN10L3.6B QS	2597969
OK-LN10S3.6B SC	2599150
OK-LN11L3.6B QS	2597970
OK-LN11S3.6B SC	2957463

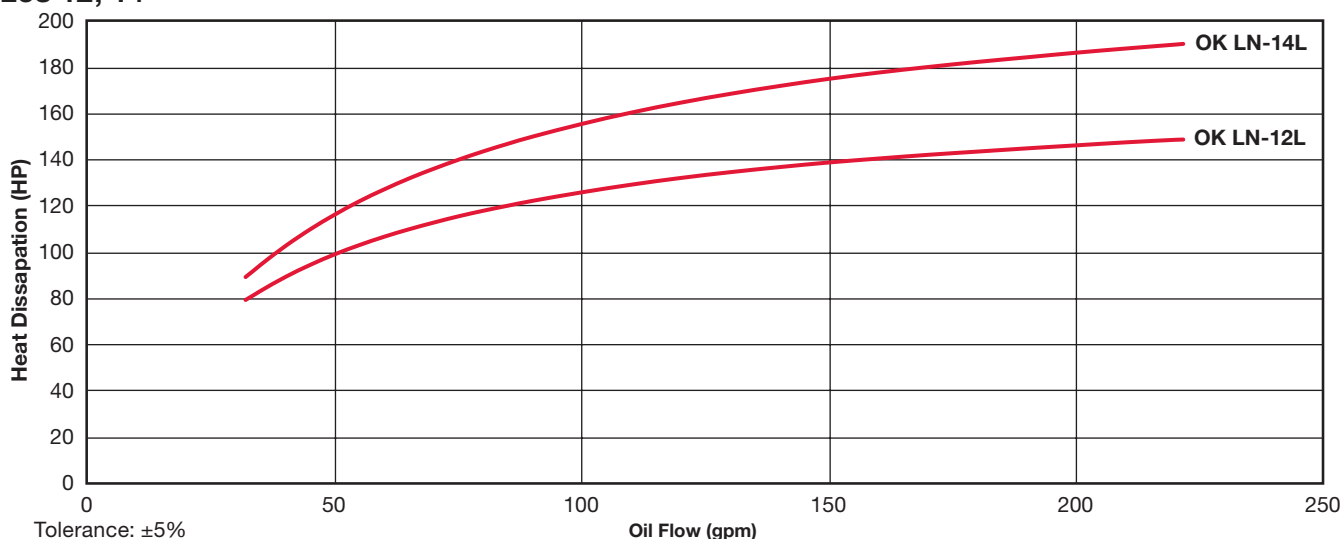
Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability

# INDUSTRIAL COOLERS

## Heat Dissipation @ $\Delta T = 40^\circ\text{F}$ Sizes 8 -11

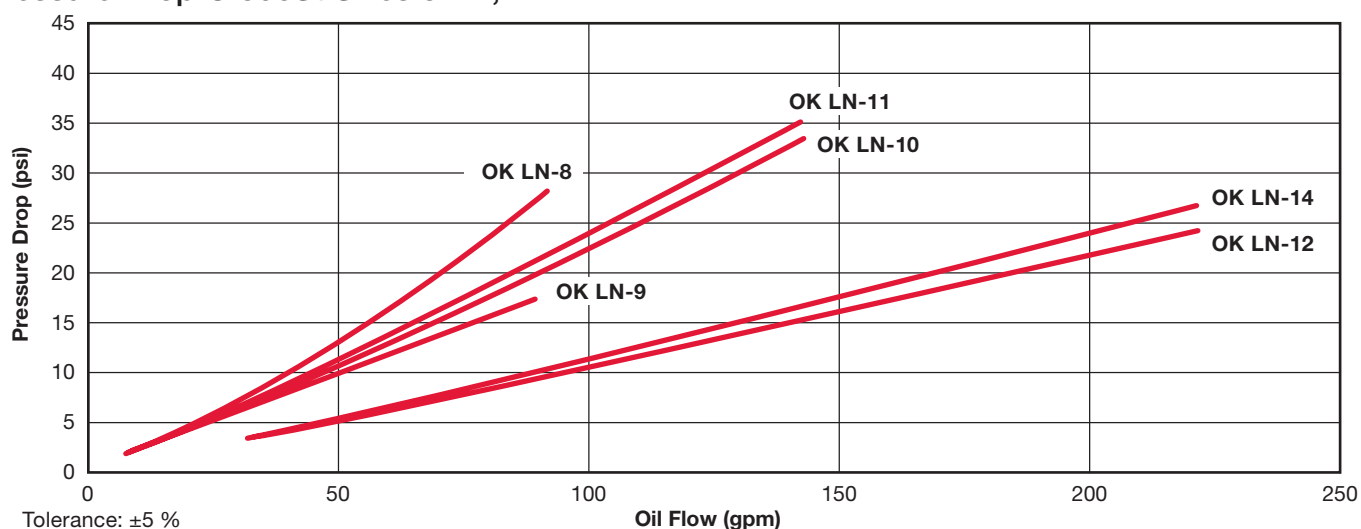


## Sizes 12, 14



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

## Pressure Drop @ 30cSt Sizes 8 -12, 14



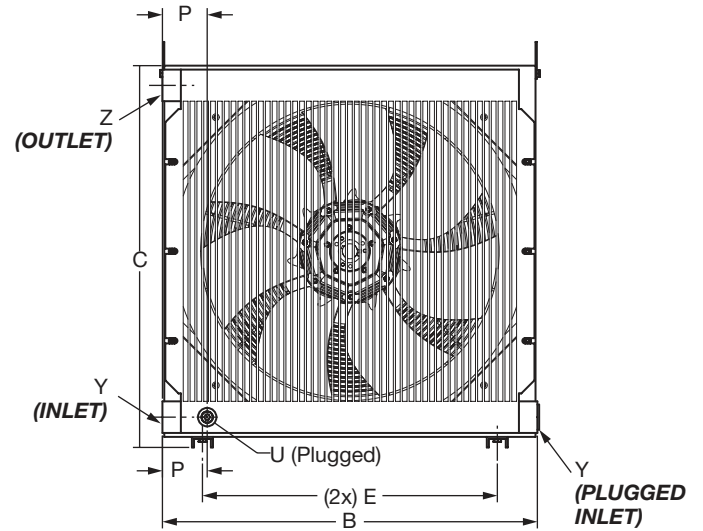
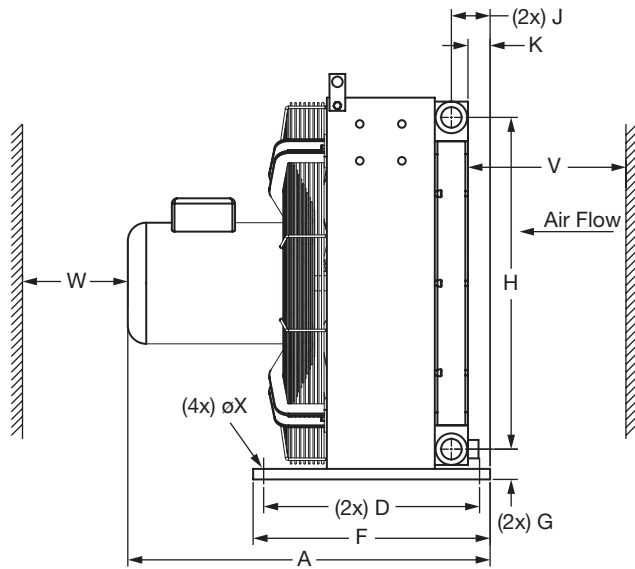
Note: Values measured at  $\Delta T$  of  $40^\circ\text{F}$ , may vary at lower  $\Delta T$ .

Pressure drop curves above use fluid viscosity of 30 cSt. For other viscosities the result must be multiplied by the K factors below.

## K Factor Chart

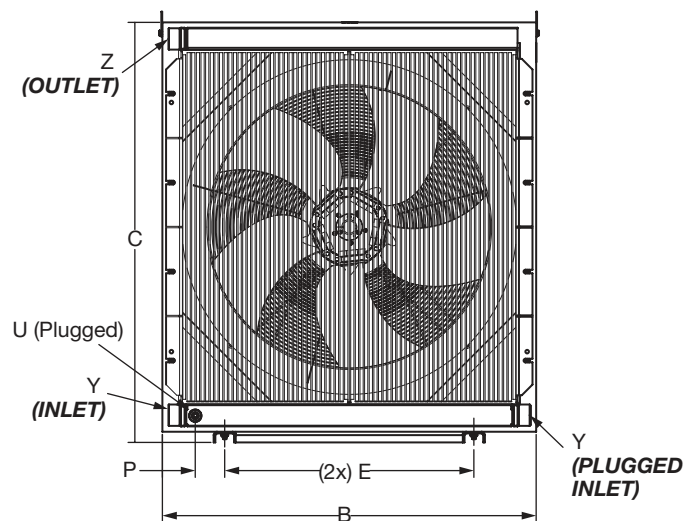
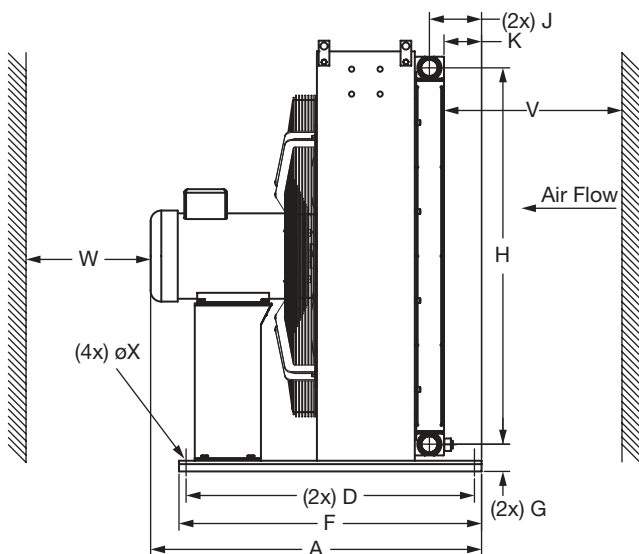
K Factor	0.5	0.65	0.77	1	1.3	1.52	1.9	2.8	5.3
Viscosity (SSU)	46	70	102	150	213	250	315	464	695
Viscosity (cSt)	10	15	22	32	46	54	68	100	150

## Dimensions OK LN Size 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
Size	K	P	U	V	W	X	Y	Z	
OKLN8L,S3.6B	1.65	3.21	1/2" NPT	23.62	47.24	ø0.35x0.78 Slot	SAE-20	SAE-20	
OKLN9L3.6B	4.21	3.34	1/2" NPT	35.43	98.43	0.47	SAE-24	SAE-24	

## Dimensions OK LN Size 10 - 11



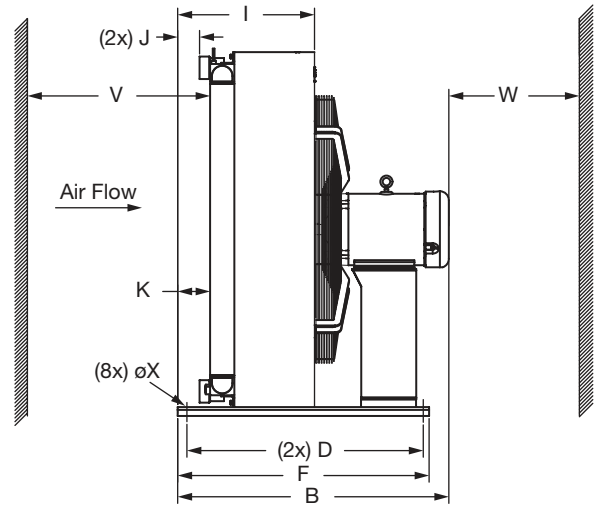
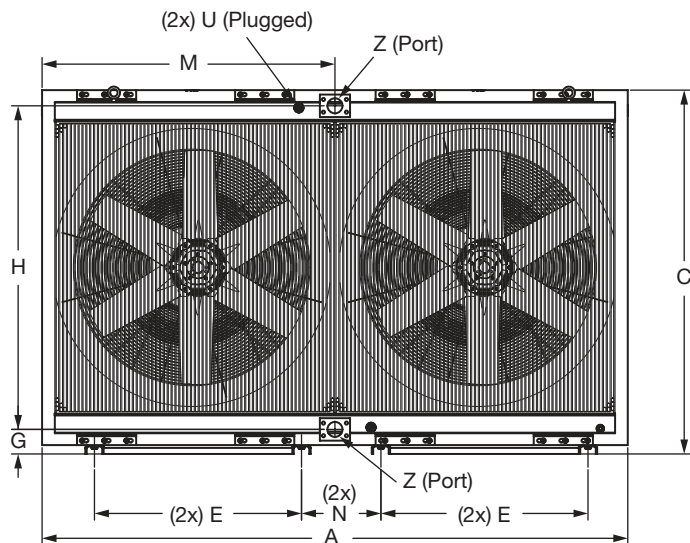
Size	A	B	C	D	E	F	G	H	J
OKLN10L3.6B	36.09	36.61	40.55	31.89	27.56	33.46	2.95	35.83	6.31
OKLN11L3.6B	36.60	41.34	46.46	31.89	27.56	33.46	3.01	41.61	5.77
Size	K	P	U	V	W	X	Y	Z	
OKLN10L3.6B	4.23	3.72	1/2" NPT	35.43	110.24	0.47	SAE 24	SAE 24	
OKLN11L3.6B	4.15	3.63	1/2" NPT	39.37	118.11	0.47	SAE 24	SAE 24	

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

# INDUSTRIAL COOLERS

## Dimensions

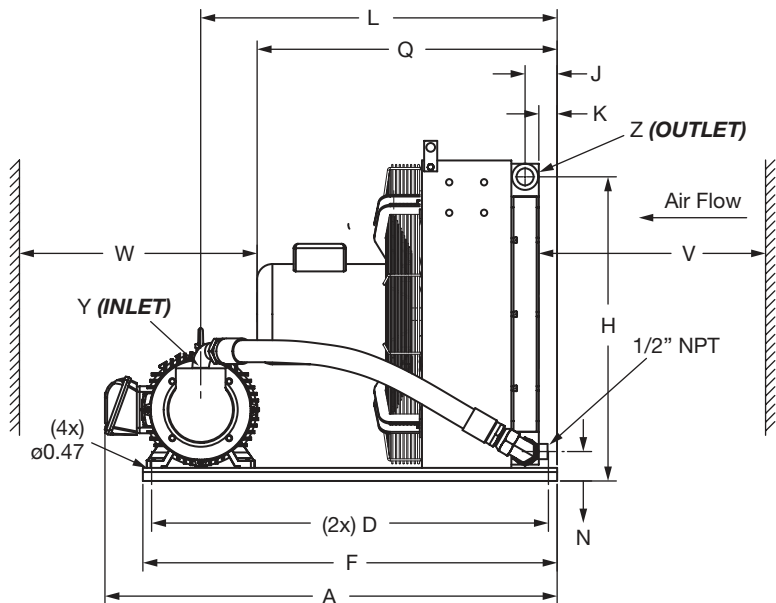
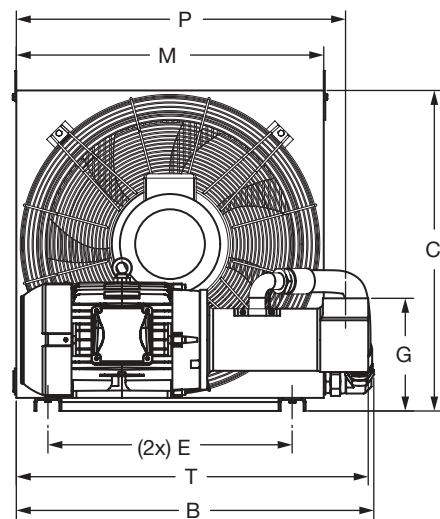
### OK LN Size 12 - 14



Size	A	B	C	D	E	F	G	H
OKLN12	72.8	36.1	43.7	31.9	27.5	33.5	3.97	37.0
OKLN14	77.9	36.8	48.4	31.9	27.5	33.5	3.3	43.0
Size	K	M	U	V	W	X	Y/Z	
OKLN12	36.4	36.4	1/2" NPT	35.4	110	.475	2" SAE Code 61	
OKLN14	38.9	38.9	1/2" NPT	39.4	118	.475	2" SAE Code 61	

## Dimensions

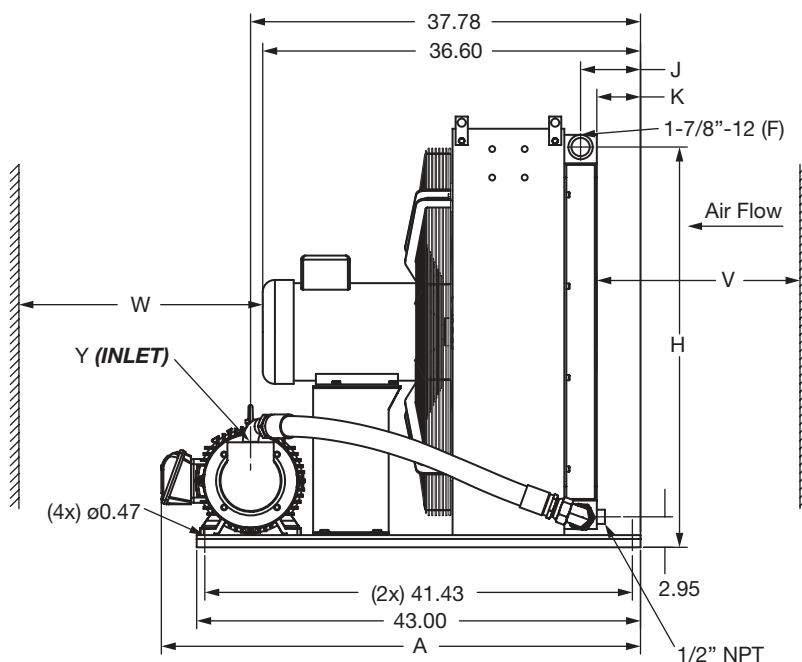
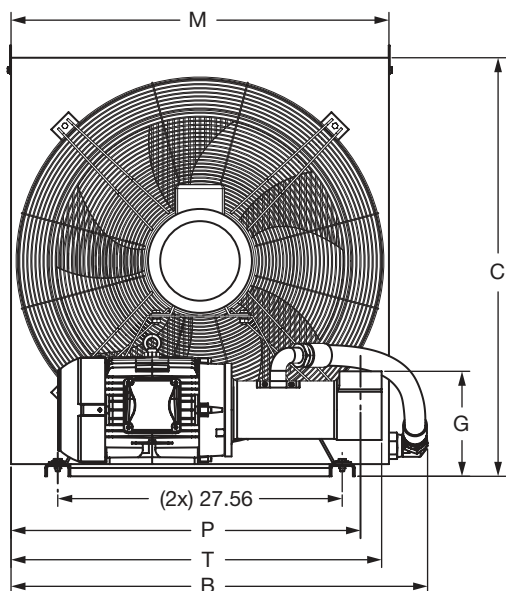
### OKA LN Size 8 - 9



Size	A	B	C	D	E	F	G	H	J	K
8L,S3.6B70	39.05	32.24	28.94	35.83	22.05	37.4	9.00	27.46	2.89	1.65
8L,S3.6B100, 130	40.85	32.24	28.94	35.83	22.05	37.4	10.17	27.46	2.89	1.65
9L,S3.6B70	44.64	35.48	34.65	41.43	27.56	43.0	9.00	32.82	5.83	4.21
9L,S3.6B100, 130	46.45	35.48	34.65	41.43	27.56	43.0	10.17	32.82	5.83	4.21
Size	L	M	N	P	Q	T	V	W	Y	Z
8L,S3.6B70	32.18	27.76	2.66	29.72	27.09	31.50	23.62	47.24	SAE 2"	SAE 20
8L,S3.6B100, 130	32.18	27.76	2.66	29.72	27.09	31.77	23.62	47.24	SAE 2-1/2"	SAE 20
9L,S3.6B70	37.78	31.10	2.95	31.10	33.15	32.87	35.43	98.43	SAE 2"	SAE 24
9L,S3.6B100, 130	37.78	31.10	2.95	31.10	33.15	33.15	35.43	98.43	SAE 2-1/2"	SAE 24

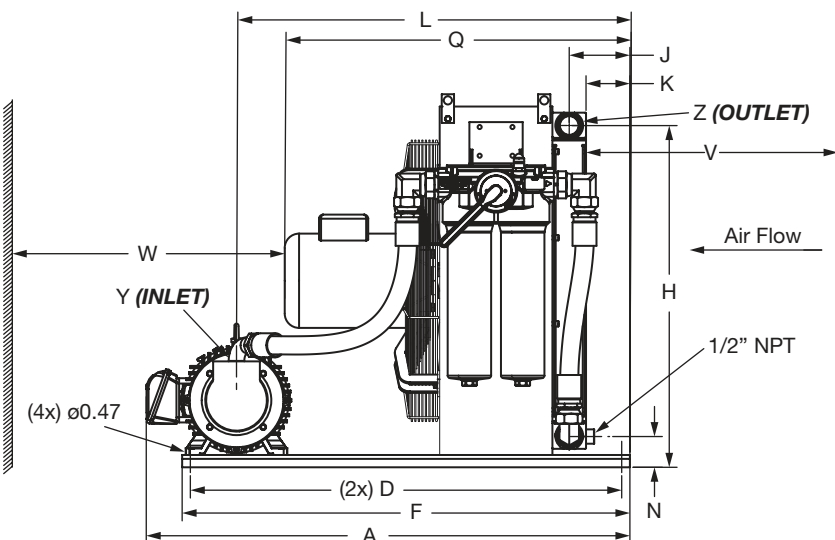
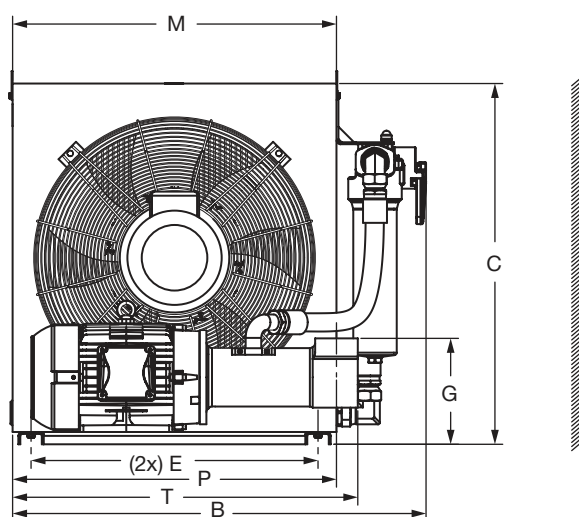
Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

## Dimensions OKA LN Size 10 - 11



Size	A	B	C	D	E	F	G	H	J	K
8L, S3.6B70	39.05	32.24	28.94	35.83	22.05	37.4	9.00	27.46	2.89	1.65
8L,S3.6B100, 130	40.85	32.24	28.94	35.83	22.05	37.4	10.17	27.46	2.89	1.65
9L,S3.6B70	44.64	35.48	34.65	41.43	27.56	43.0	9.00	32.82	5.83	4.21
9L,S3.6B100, 130	46.45	35.48	34.65	41.43	27.56	43.0	10.17	32.82	5.83	4.21
Size	L	M	N	P	Q	T	V	W	Y	Z
8L, S3.6B70	32.18	27.76	2.66	29.72	27.09	31.50	23.62	47.24	SAE 2"	SAE 20
8L,S3.6B100, 130	32.18	27.76	2.66	29.72	27.09	31.77	23.62	47.24	SAE 2-1/2"	SAE 20
9L,S3.6B70	37.78	31.10	2.95	31.10	33.15	32.87	35.43	98.43	SAE 2"	SAE 24
9L,S3.6B100, 130	37.78	31.10	2.95	31.10	33.15	33.15	35.43	98.43	SAE 2-1/2"	SAE 24

## Dimensions OKAF LN Size 8 - 9



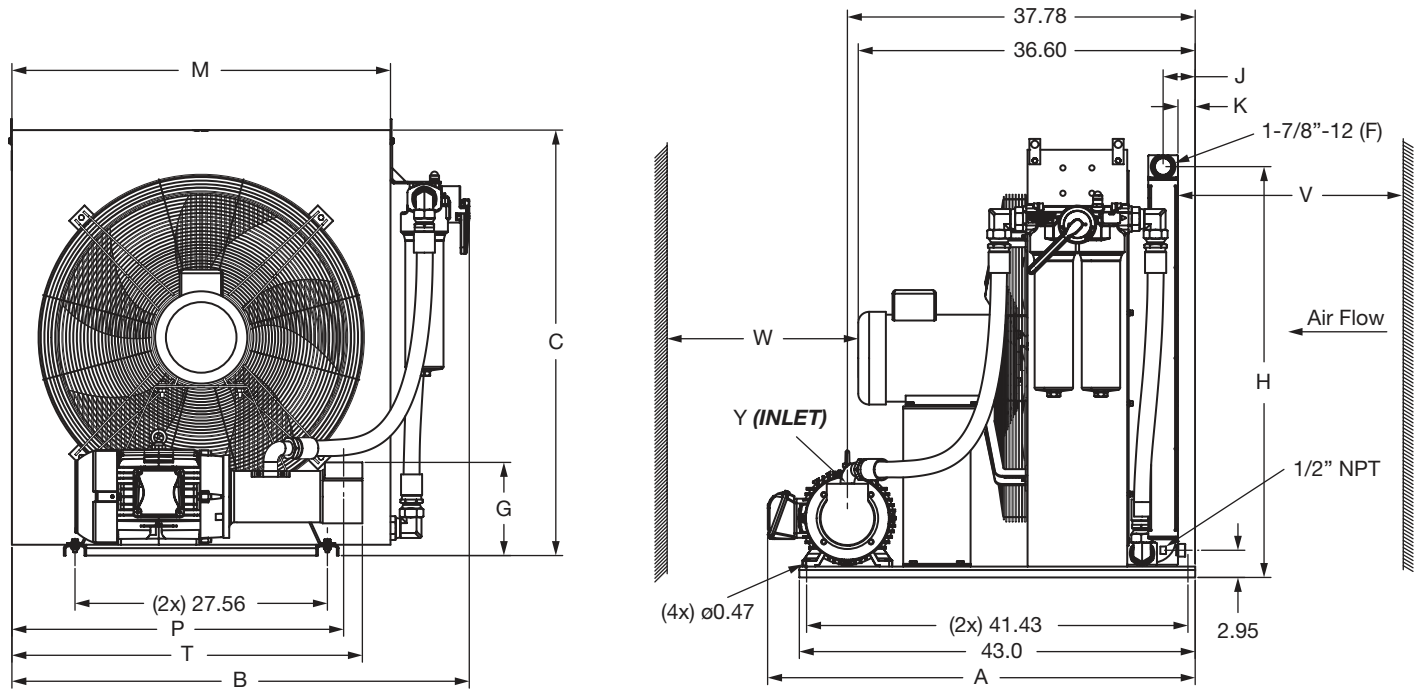
Size	A	B	C	D	E	F	G	H	J	K	L
OKAFLN8L,S3.6B70	39.05	36.36	28.94	35.83	22.05	37.40	9.00	27.46	2.89	1.65	32.18
OKAFLN8L,S3.6B100,130	40.85	36.36	28.94	35.83	22.05	37.40	10.17	27.46	2.89	1.65	32.18
OKAFLN9L,S3.6B70	44.64	39.70	34.65	41.43	27.56	43.00	9.00	32.82	5.83	4.21	37.78
OKAFLN9L,S3.6B100,130	46.45	39.70	34.65	41.43	27.56	43.00	10.17	32.82	5.83	4.21	37.78
Size	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	SAE 20		
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	SAE 20		
OKAFLN9L,S3.6B70	31.10	2.95	31.10	33.15	32.87	35.43	98.43	SAE 2" Code 61 Flange	SAE 24		
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	SAE 24		

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

# INDUSTRIAL COOLERS

## Dimensions

### OKAF LN Size 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.





# INDUSTRIAL COOLERS

## ELD M Series

Rear Mounted NEMA Motor Coolers

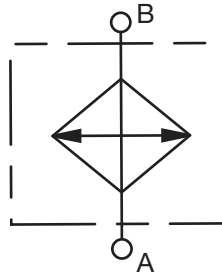


### Features

These coolers use a bar-and plate design for high efficiency. Included with the cooler package is a shroud with gasket to seal to the motor fan and adjustable mounting feet.

- 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

### Hydraulic Symbol



### Applications



Industrial

### Technical Specifications

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

Preferred ELDM Models	P/N
ELD1.5M1.5 QS	2595792
ELD2M1.5 QS	2595793
ELD3M1.5 QS	2595794

## Model Code

**ELD 1.5M 1.5**

**Model** \_\_\_\_\_

ELD = Air Cooled Oil Cooler

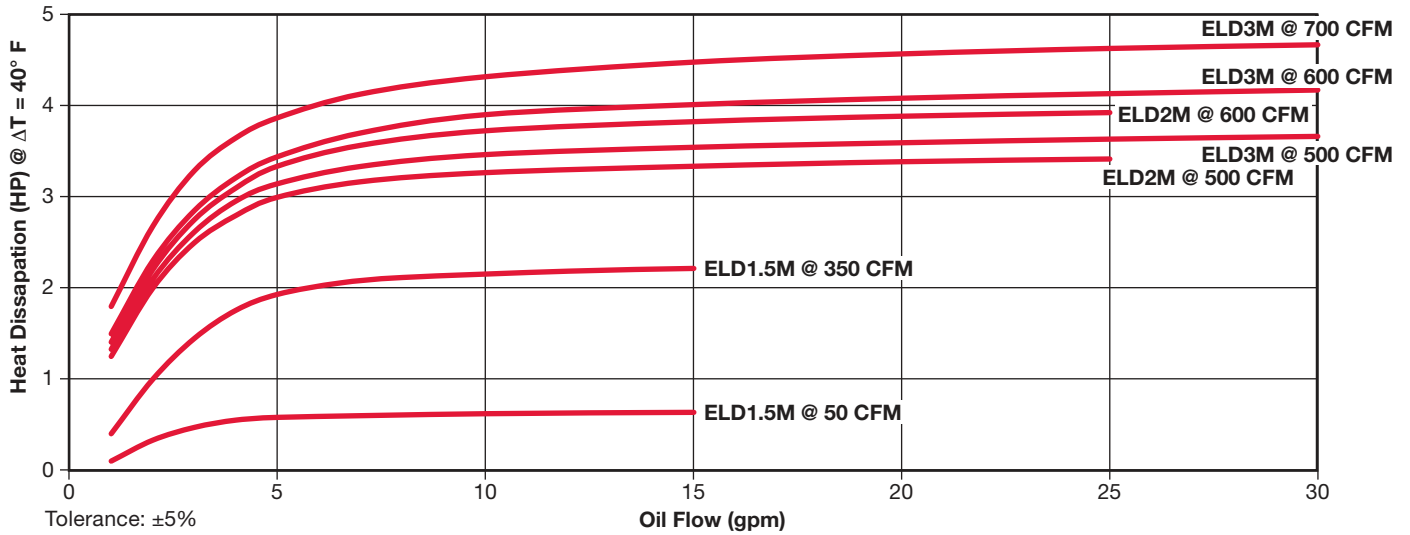
**Size** \_\_\_\_\_

1.5M  
2M  
3M

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

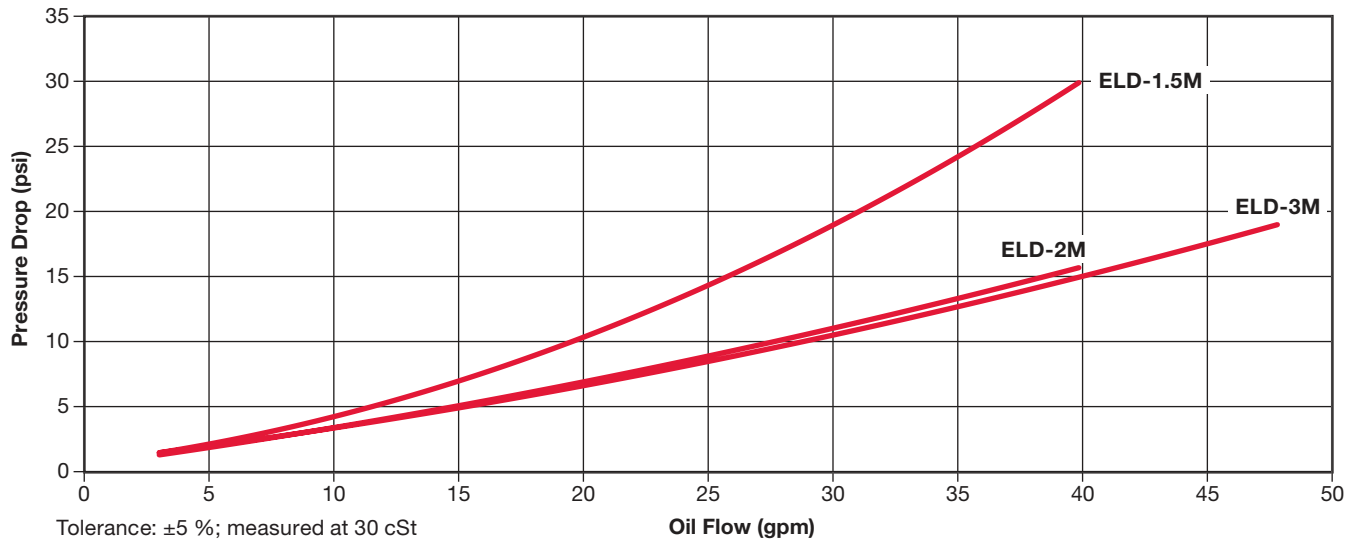
*Model Codes containing RED are non-stock items – Minimum quantities may apply – Contact HYDAC for information and availability*

## Heat Dissipation



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

## Pressure Drop



Note: Values measured at  $\Delta T$  of  $40^\circ F$ , may vary at lower  $\Delta T$ .

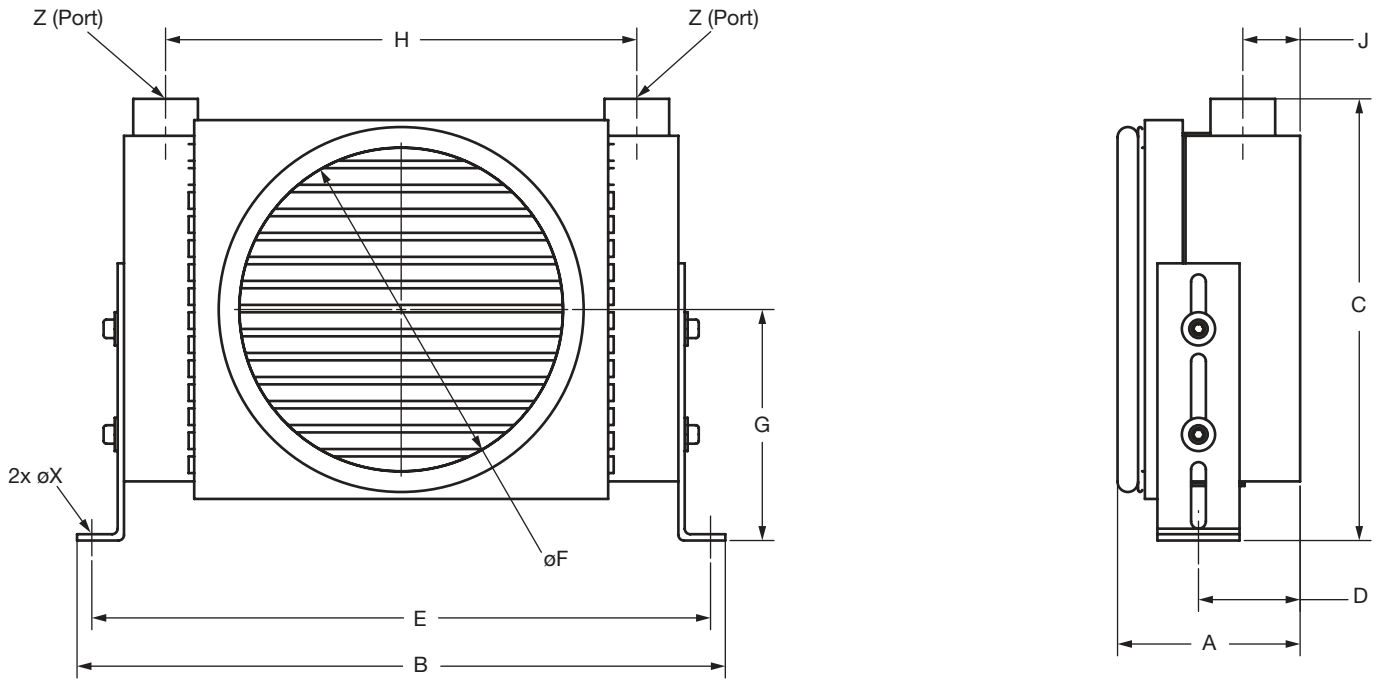
Pressure drop curves above use fluid viscosity of 30 cSt. For other viscosities the result must be multiplied by the K factors below.

## K Factor Chart

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

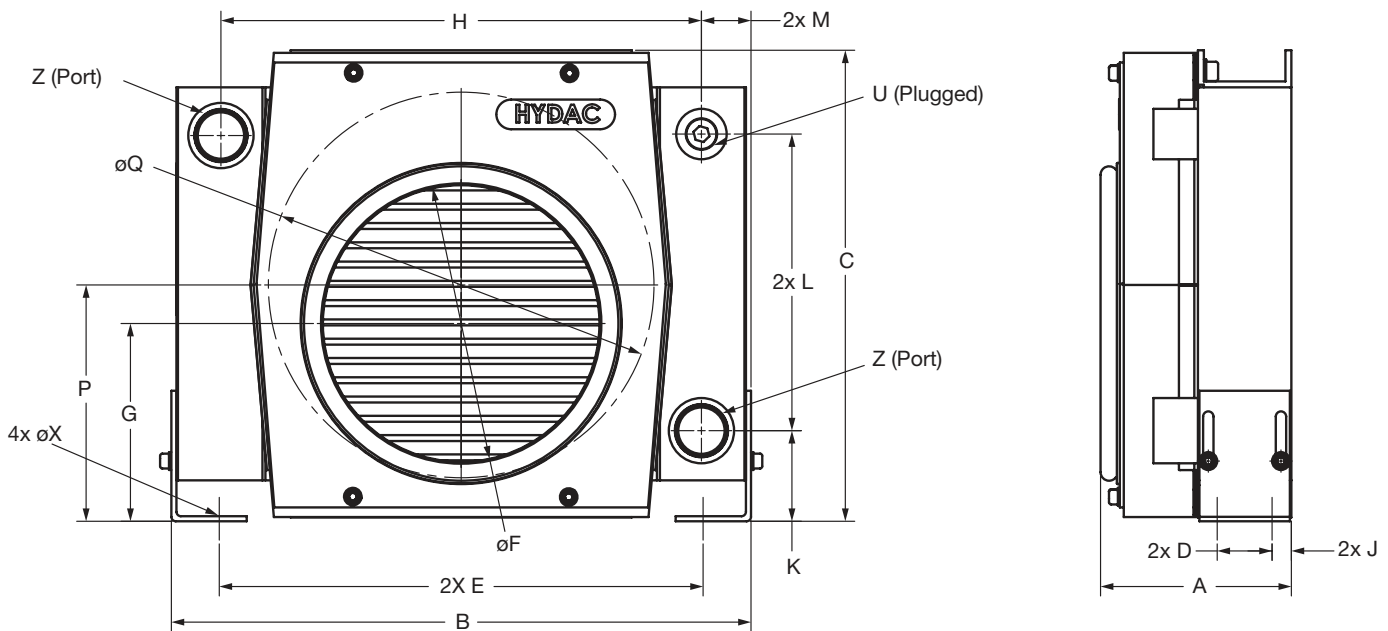
# INDUSTRIAL COOLERS

## Dimensions ELD M 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	SAE 12

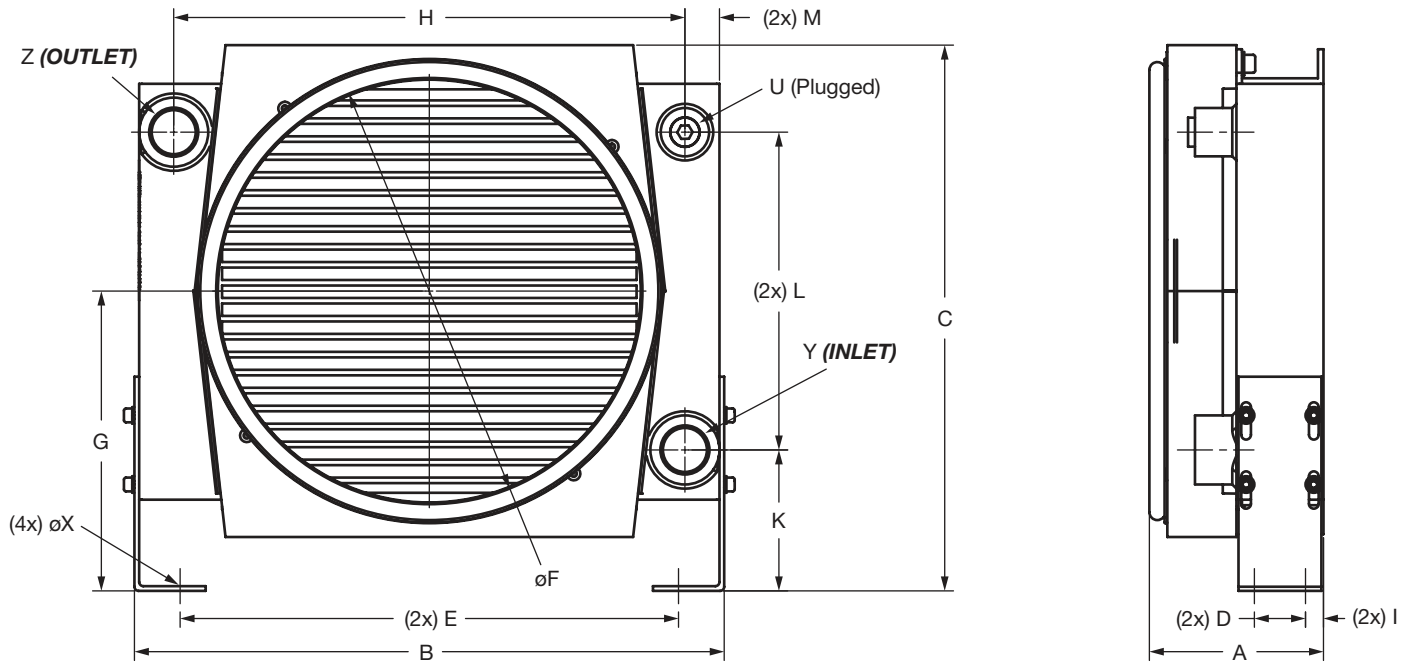
## Dimensions ELD M Size 2



A	B	C	D	E	F	G	H	J
5.07	15.39	12.50 - 13.68	1.46	12.84	7.34	5.25 - 6.43	12.76	0.51
K	L	M	P	Q	U	X	Y	Z
2.41 - 3.59	7.87	1.32	6.27 - 7.45	10.24	1/2" NPT	ø0.35x0.55 slot	1-5/16"-12 (F)	SAE 16

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

## Dimensions ELD M Size 3



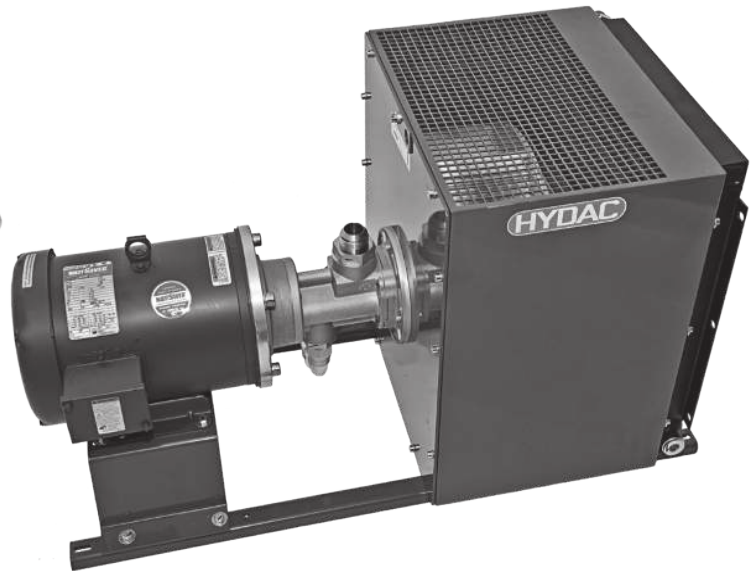
A	B	C	D	E	F	G	H
5.07	16.80	15.55 - 16.34	1.46	14.20	12.05	8.54 - 9.33	14.57
I	K	L	M	U	X	Y	Z
0.51	4.02 - 4.80	9.06	0.98	1/2" NPT	ø0.35x0.55 slot	1-5/16"-12 (F)	SAE 16

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

# INDUSTRIAL COOLERS

## SC Series - AC Motor Drive

Air Cooled Oil Coolers



### Features

The SC Series cooler design uses a radial blower wheel to pull air through the heat exchanger and then exit from the top. This allows for excellent cooling capacity as well as low noise.

- Up to 16 HP cooling capacity
- Highly efficient and rugged 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.
- Packaged systems with pump flows ranging from 3.1 gpm to 12.75 gpm

### Applications



Gearboxes



Industrial



Elevators



Power Generation



Pulp & Paper



Railways

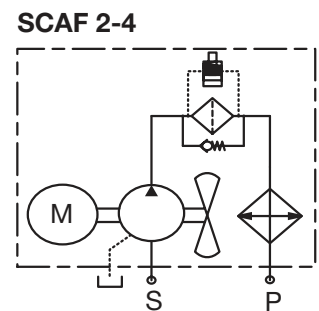
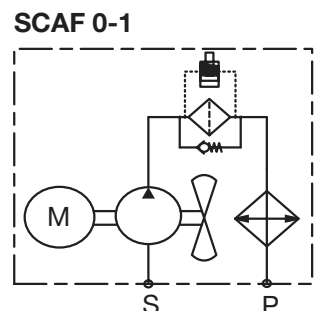
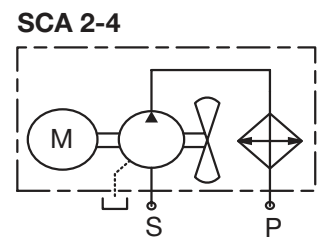
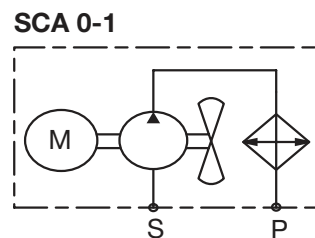
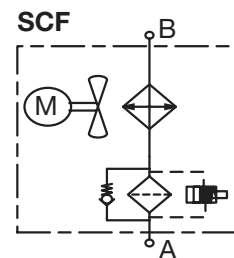
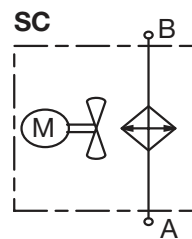


Shipbuilding



Steel / Heavy Industry

### Hydraulic Symbol



## General

<b>Materials</b>	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
<b>Mounting Position</b>	Horizontal, motor shaft
<b>Maximum Pressure</b>	w/o Pump: 230 psi (16 bar) Dynamic 290 psi (20 bar) Static with Pump: 90 psi (6 BAR)*
<b>Fluids</b>	Mineral oil to DIN 51524 Part 1 and 2 <i>(Contact factory for other fluid usages)</i>
<b>Contamination Limit</b>	Permissible contamination < NAS 12
<b>Max Viscosity</b>	w/o Pump: 2000 cst with Pump: 180 cst
<b>Ambient Temperature</b>	50°F (10°C) to 104°F (40°C)
<b>Maximum Oil Temperature</b>	w/o Pump: 266°F (130°C) with Pump: 175°F (80°C)
<b>Air Flow Direction</b>	Pulled across Heat Exchanger

## Technical Specifications

Model	Description	Max. Oil Flow Rate (gpm)	Fluid Specifications		Noise (dBa @ 1 m)	Motor Specifications		
			Pump Displacement - Flow Rate			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 N/A	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 N/A	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 N/A	84	N/A	3.0	1800

# INDUSTRIAL COOLERS

## Model Code

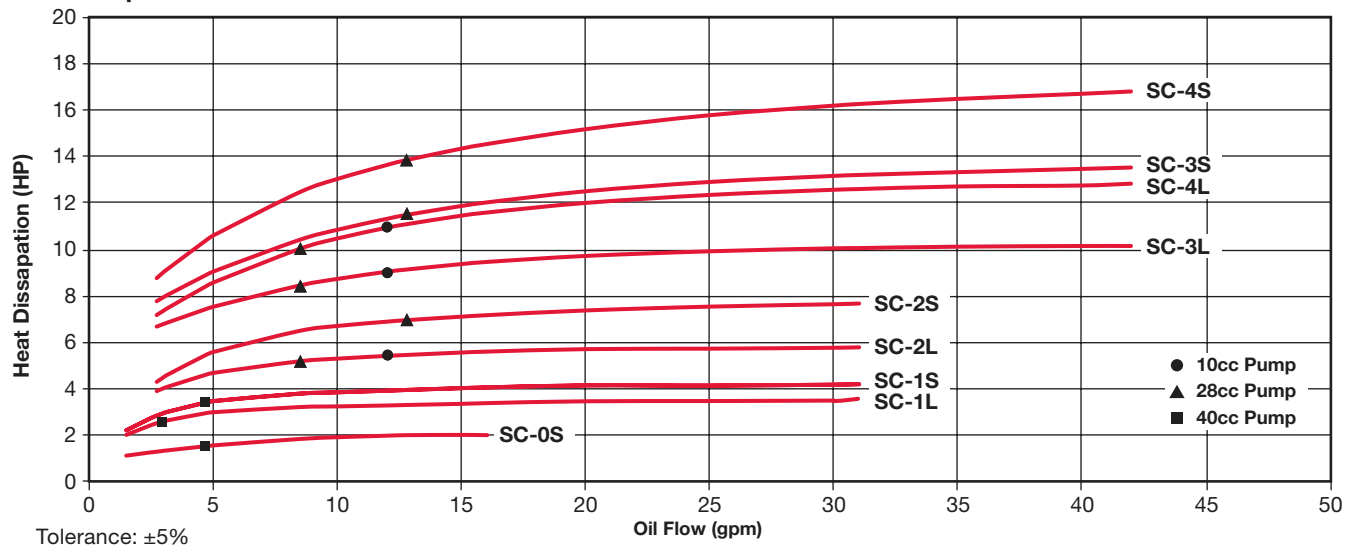
	SCAF	3L	1.6	B	28	MF190	3	B	IBP	2	TS120
<b>Model</b>											
SC	= Basic Cooler										
SCF	= Cooler with Filter										
SCA	= Cooler with Pump										
SCAF	= Cooler with Pump & Filter										
<b>Size</b>											
0S, 1L, 1S, 2L, 2S, 3L, 3S, 4L, 4S	(Note: S = 1800 RPM, L = 1200 RPM)										
<b>Modification Number</b>	(latest version supplied)										
<b>Motor Voltage</b>											
B	= 230/460 Volts, 3ph										
C	= 575 Volts, 3ph										
X	= No Motor										
<b>Pump</b>											
(omit)	= No Pump										
10	= 10 ccm/rev, L=3.1gpm, S=4.75gpm (sizes 0S, 1L 1S only)										
28	= 28 ccm/rev, L=8.4, S=12.75 (sizes 2L, 2S 3L, 3S, 4L 4S only)										
40	= 40 ccm/rev, L=12 gpm (sizes 2L, 3L, 4L only)										
<b>Filter Type</b>											
(omit)	= No Filter										
MF95	= Spin-On, 25 rated gpm										
MF190	= Spin-On, 30 rated gpm										
MF195	= Spin-On, 60 rated gpm										
LPF160	= Cartridge Filter, 43 rated gpm										
LPF240	= Cartridge Filter, 63 rated gpm										
FLND250	= Duplex Filter, 66 rated gpm (sizes 2-4 only)										
<b>Micron Rating</b>											
(omit)	= No Filter										
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	= 24 VDC Lamp/Switch (LPF + FLND filters only)										
D115	= 115 VAC Lamp/Switch (LPF + FLND filters only)										
D230	= 230 VAC Lamp/Switch (LPF + FLND filters only)										
<b>Accessories</b>											
(omit)	= None										
IBT	= Internal Thermostatic Bypass Valve										
IBP	= Internal Pressure Bypass Valve										
<b>Opening Temperature</b>	(IBT Only)										
45	= Opens 113°F (45°C) Closes at 131°F (55°C)										
50	= Opens 130°F (50°C) Closes at 150°F (65°C)										
60	= Opens 140°F (60°C) Closes at 158°F (70°C)										
<b>Opening Pressure</b>	(IBT & IBP)										
2	= 2 bar (29psi)										
3	= 3 bar (45psi)										
4	= 4 bar (58 psi)										
<b>Temperature Switch</b>											
TR1	= Reservoir Thermostat, adjustable 32° to 200°F (must be ordered as a separate line item)										
AITR	= Inline Thermostat, adjustable 32°F to 200°F										
TS-120	= Inline Temperature Switch, Fixed 120°F										
TS-140	= Inline Temperature Switch, Fixed 140°F										
TS-160	= Inline Temperature Switch, Fixed 160°F (All TS options are for SC or SCF coolers only)										

Preferred SCA Models	P/N
SCA1L1.5B10 SC	2592739
SCA2L1.6B40 SC	2950767
SCA3L2.6B40 SC	2598729

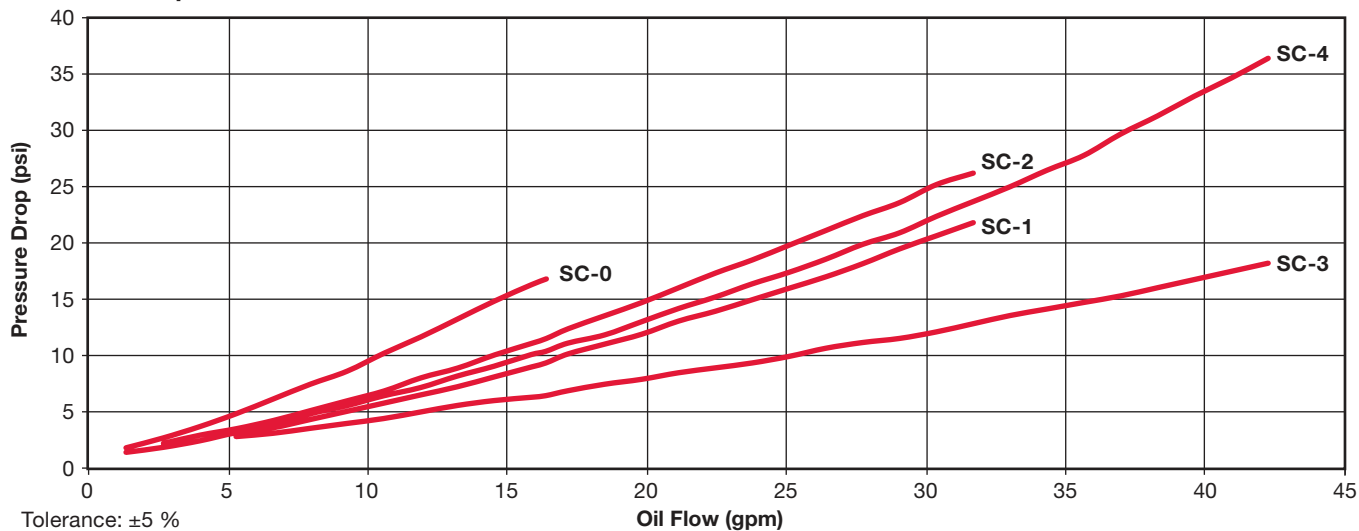
Model Codes containing RED are Options – Contact HYDAC Cooling Division for information and availability



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



## Pressure Drop @ 30cSt



Note: Values measured at  $\Delta T$  of  $40^\circ F$ , may vary at lower  $\Delta T$ .

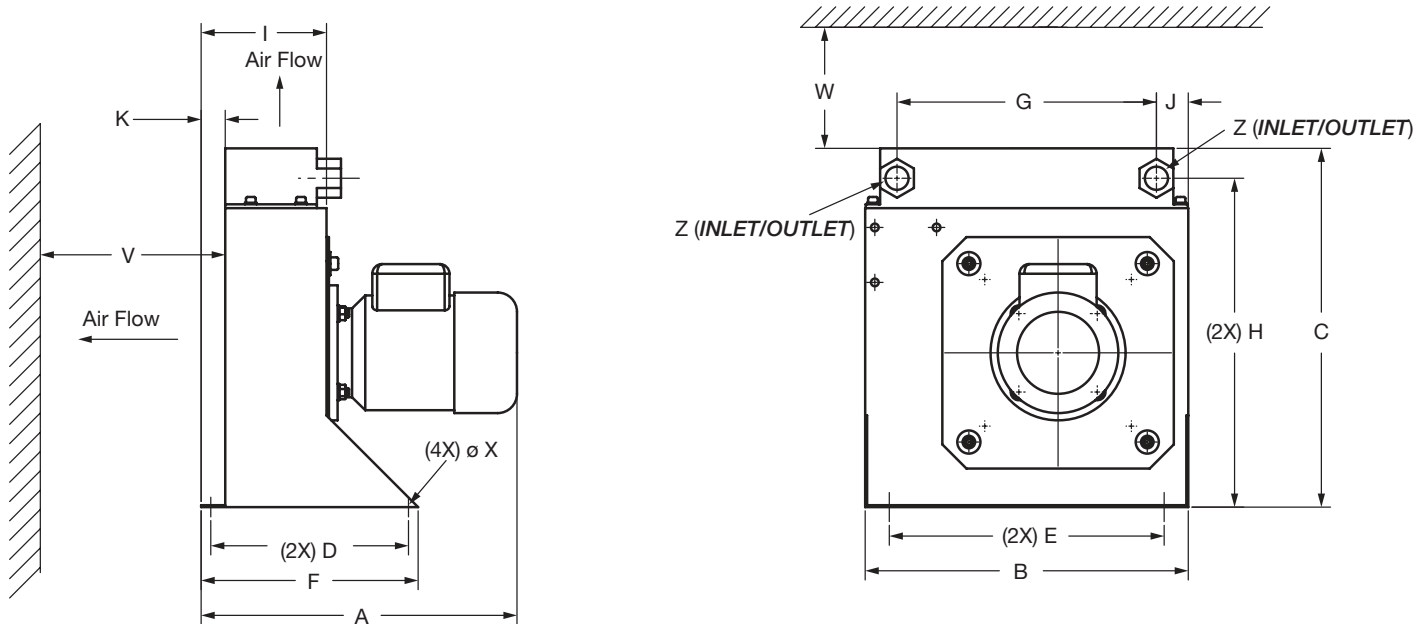
Pressure drop curves above use fluid viscosity of 30 cSt. For other viscosities the result must be multiplied by the K factors below.

## K Factor Chart

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

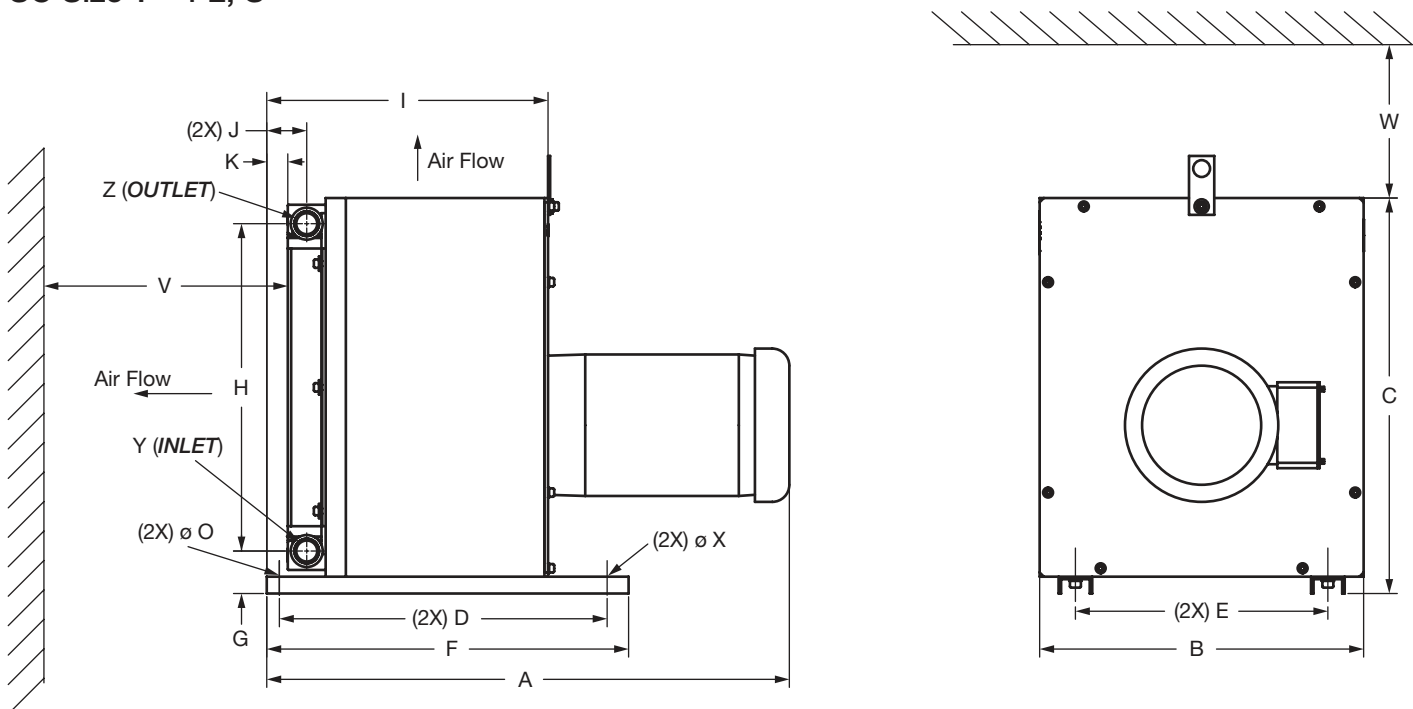
# INDUSTRIAL COOLERS

## Dimensions SC Size 0S



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	ø0.35	SAE 12

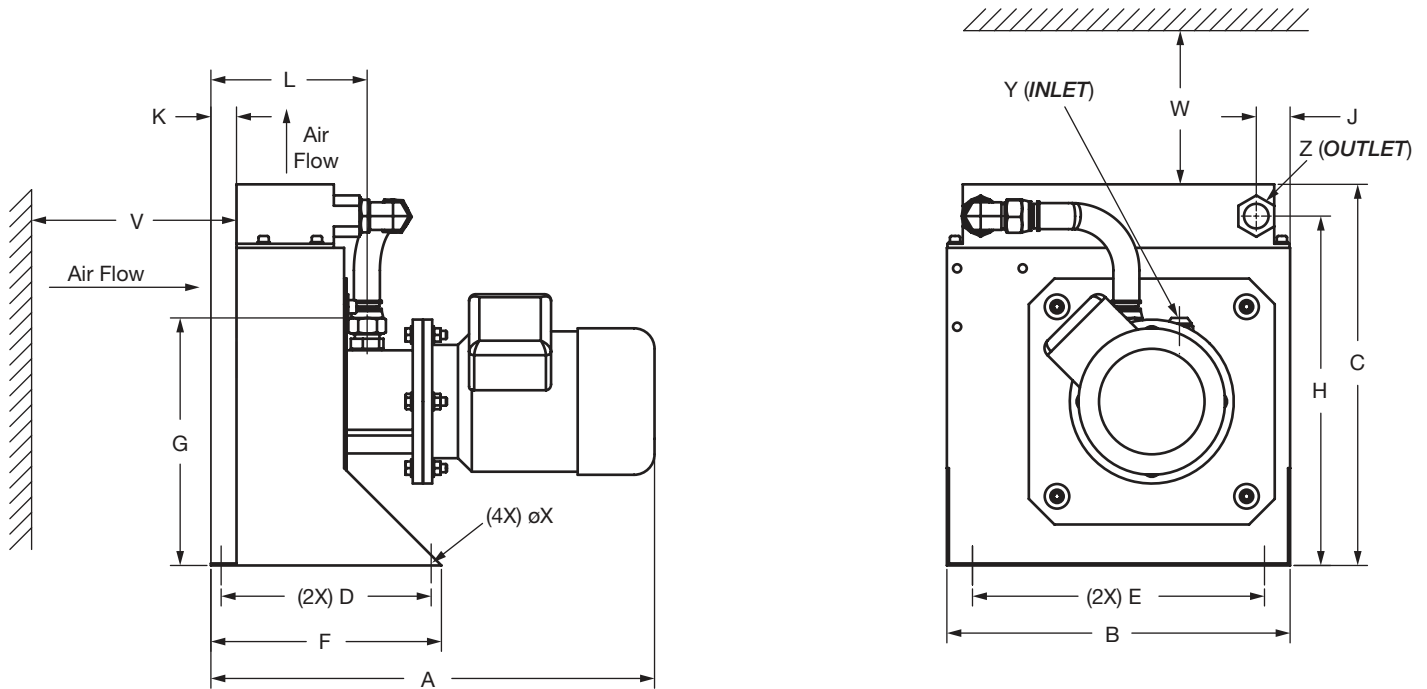
## Dimensions SC Size 1 - 4 L, S



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	ø0.35x1.2 Slot	1-1/16"-12 (F)	SAE 12
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	ø0.35x1.2 Slot	1-1/16"-12 (F)	SAE 12
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	ø0.35x1.2 Slot	1-1/16"-12 (F)	SAE 12
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	ø0.35x1.2 Slot	1-5/16"-12 (F)	SAE 16

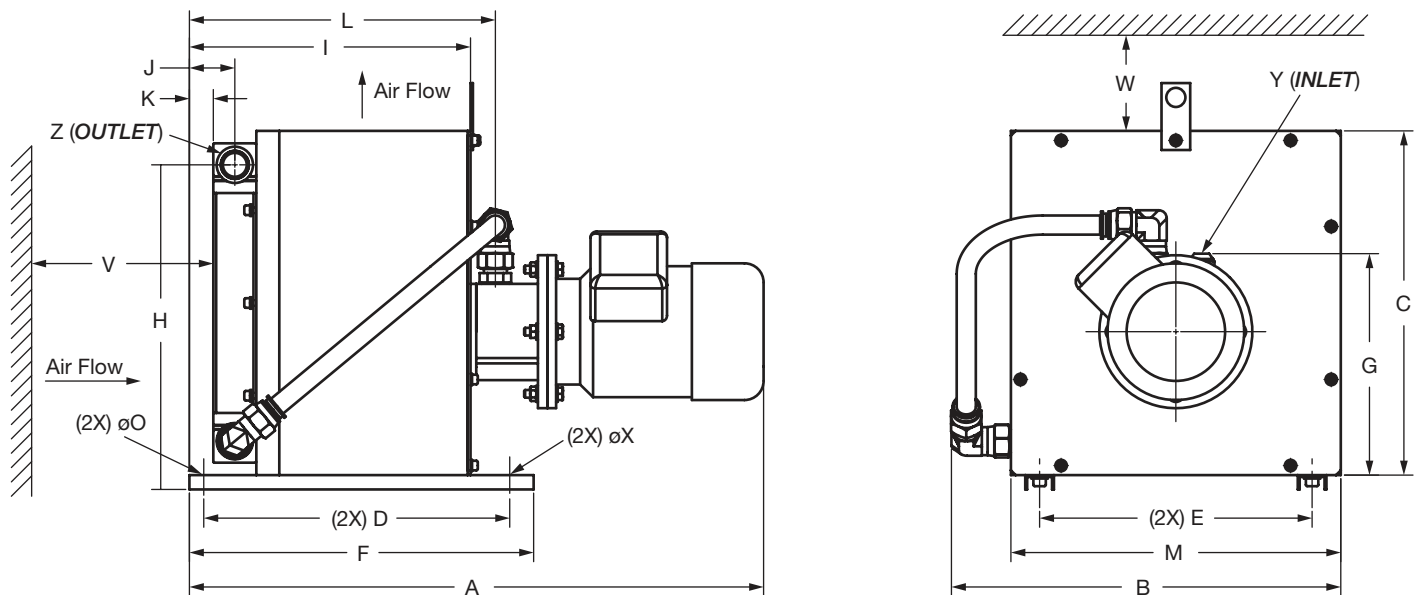
Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

## Dimensions SCA Size 0S



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	ø0.35	1 1/16"-12 JIC-12 (M)	SAE 12

## Dimensions SCA Size 1 L, S



A	B	C	D	E	F	G	H	I	J
23.64	16.03	14.76	12.6	11.22	14.17	9.71	13.37	11.57	1.87

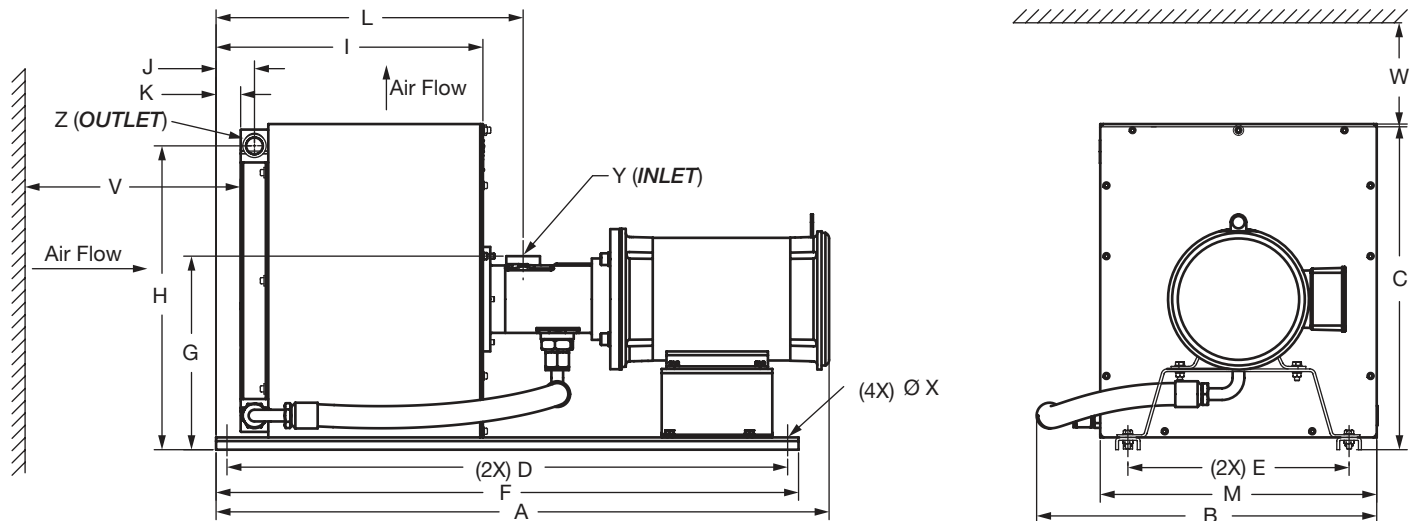
K	L	M	O	V	W	X	Y	Z
0.98	12.6	13.58	ø0.35	11.81	39.37	ø0.35x1.18 slot	1 1/16"-12 JIC-12 (M)	SAE 12

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

# INDUSTRIAL COOLERS

## Dimensions

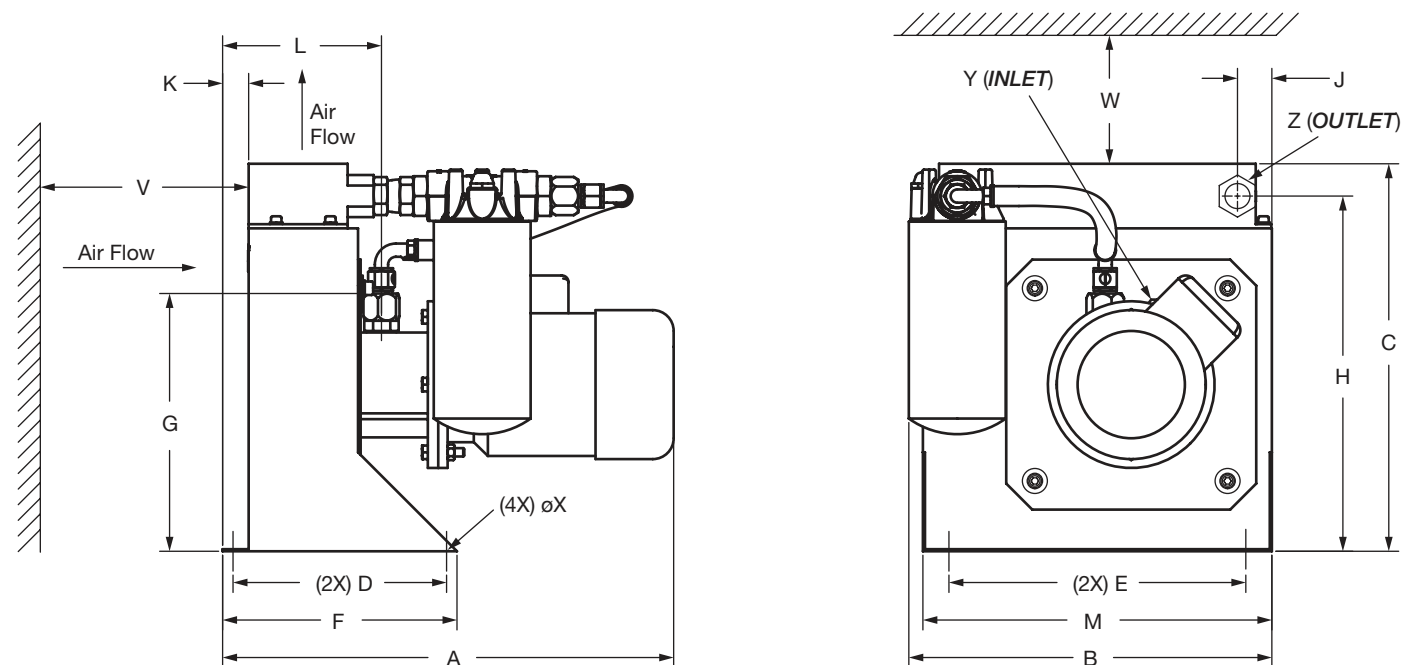
### SCA Size 2 - 4 S



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	ø0.35x1.18 Slot	SAE 16	SAE 12
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	ø0.35x1.18 Slot	SAE 24	SAE 12
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	ø0.35x1.56 Slot	SAE 16	SAE 12
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	ø0.35x1.56 Slot	SAE 24	SAE 12
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	ø0.35x1.56 Slot	SAE 16	SAE 16
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	ø0.35x1.56 Slot	SAE 24	SAE 16

## Dimensions

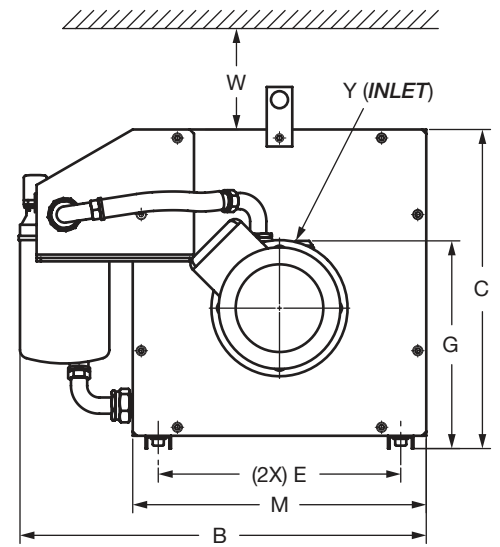
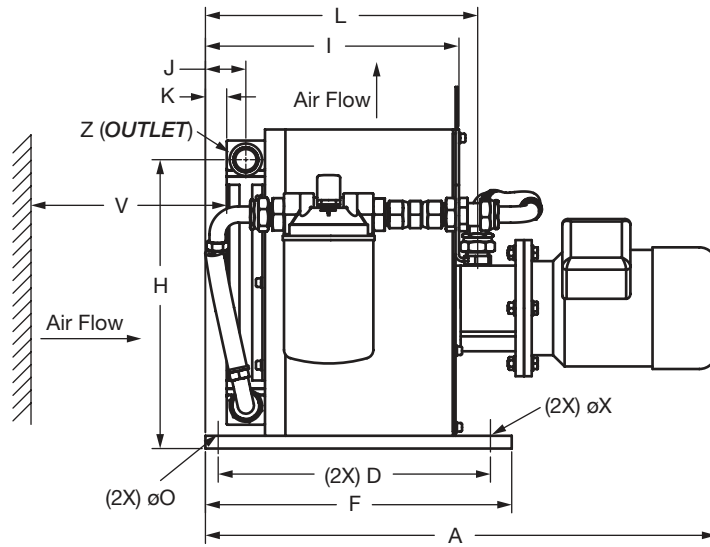
### SCAF Size 0 S



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	ø0.35	1 1/16"-12 JIC-12 (M)	SAE 12

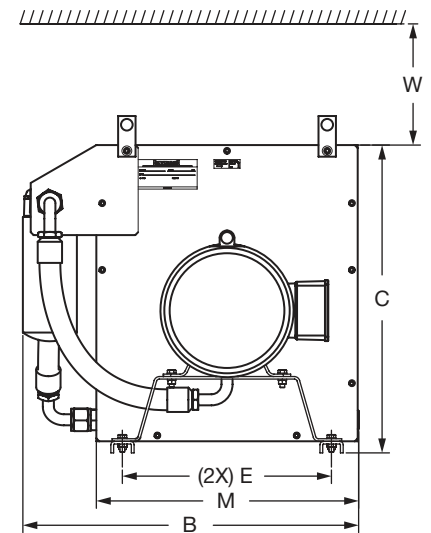
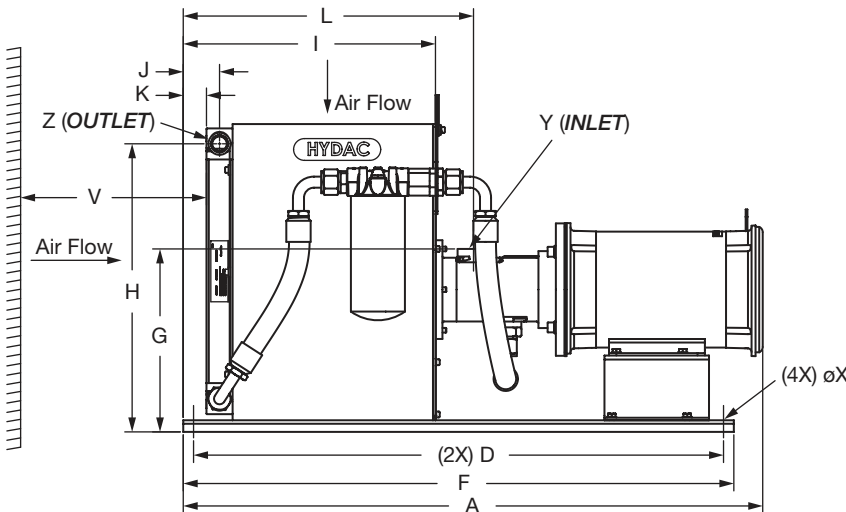
Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

## Dimensions SCAF Size 1 L, 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	ø0.35	11.81	39.37	ø0.35x1.18 slot	1 1/16"-12 JIC-12 (M)	SAE 12

## Dimensions SCAF Size 2 - 4 S



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	ø0.35x1.18 Slot	SAE 16	SAE 12
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	ø0.35x1.18 Slot	SAE 24	SAE 12
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	ø0.35x1.56 Slot	SAE 16	SAE 12
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	ø0.35x1.56 Slot	SAE 24	SAE 12
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	ø0.35x1.56 Slot	SAE 16	SAE 16
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	ø0.35x1.56 Slot	SAE 24	SAE 16

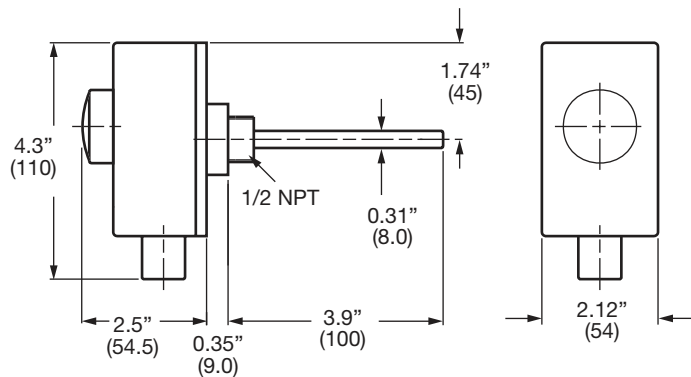
Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print. Dimensions are in inches.

# INDUSTRIAL COOLERS

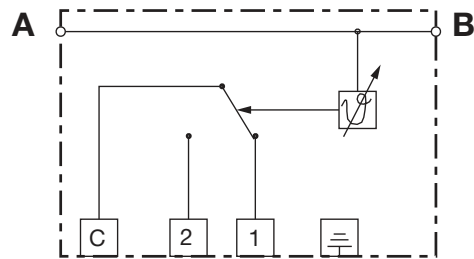
## Air Cooled Accessories

### TR1 Series

Adjustable Temperature Switch - Tank Mounted



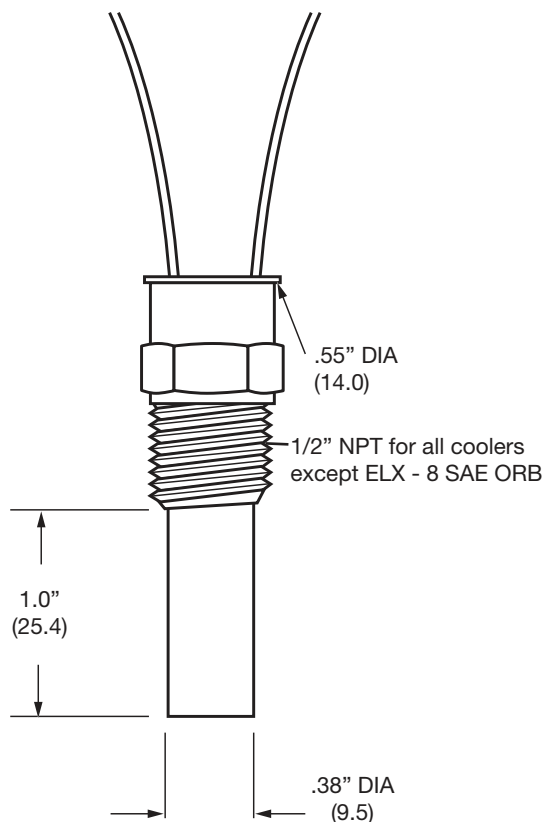
#### Hydraulic Symbol



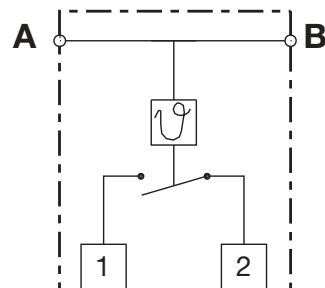
#### TR1/AITR Adjustable Thermostat

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

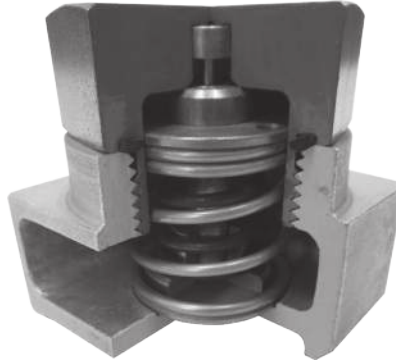


#### TS Technical Data

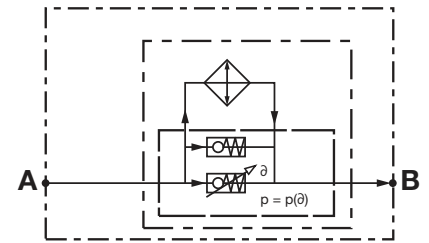
Voltage	12/24 VDC 120/220/440V
Amps	6A / 120V, 3A / 240V, 4A / 12VDC, 2A / 24VDC
Accuracy	±3%

## Bypass

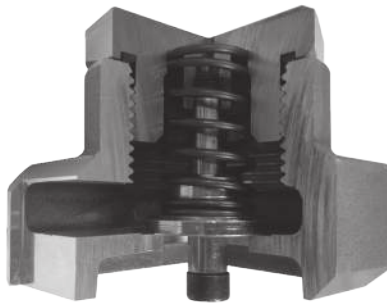
### IBT Thermostatic Bypass



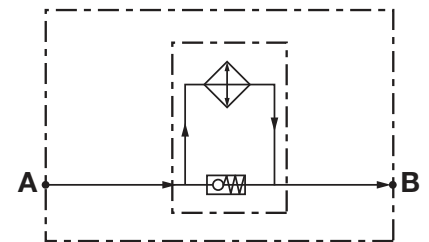
### Hydraulic Symbol



### IBP Integrated Bypass



### Hydraulic Symbol



## Model Code

### Model

- IBT = thermostatic bypass valve
- IBP = integrated 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

- 2 = 2 bar (29 psi) (standard pressure for IBT)
- 3 = 3 bar (45 psi)
- 4 = 4 bar (58 psi) (IBP only)

IBT 45 / 3



## 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.

# INDUSTRIAL COOLERS

## 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.

#### Applications



Agricultural



Automotive



Construction



Gearboxes



Industrial



Elevators



Commercial  
Municipal



Power  
Generation



Pulp & Paper



Railways

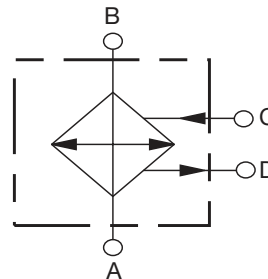


Shipbuilding



Steel / Heavy  
Industry

#### Hydraulic Symbol



#### 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, CL<sub>2</sub> < 0.5 ppm
- chloride ions CL  
< 700 ppm at 20 °C  
< 200 ppm at 50 °C

##### Other Limits:

- pH 7 – 10
- sulphate SO<sub>4</sub><sup>2-</sup> < 100 ppm
- [HCO<sub>3</sub><sup>-</sup>] / [SO<sub>4</sub><sup>2-</sup>] > 1
- ammonia, NH<sub>3</sub> < 10 ppm
- free CO < 10 ppm

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



## Model Code

HEX 610 - 10 NPT

### Series

HEX 610  
HEX 615  
HEX 722

### 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	x
722		x	x	x	x	x	x	x	x	x	x

(Other number of plates available - consult factory.)

### Port Type

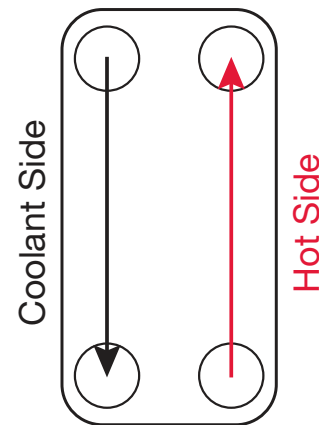
NPT = 610 + 615 series w/ 1" NPT: 422 series w/ 1-1/2" NPT  
G = 610 + 615 series w/ G1" : 422 series w/ G1-1/2"

(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.

Preferred HEX Models	Part Number
HEX 610-10 NPT QS	2582225
HEX 610-100 NPT QS	2582232
HEX 610-20 NPT QS	2582226
HEX 610-30 NPT QS	2582227
HEX 610-40 NPT QS	2582228
HEX 610-50 NPT QS	2582229
HEX 610-60 NPT QS	2582230
HEX 615-20 NPT QS	2582235
HEX 615-30 NPT QS	2582236
HEX 615-40 NPT QS	2582237
HEX 615-50 NPT QS	2582238
HEX 615-60 NPT QS	2582239
HEX 615-80 NPT QS	2582240



Fluid flow should be opposite per this picture.

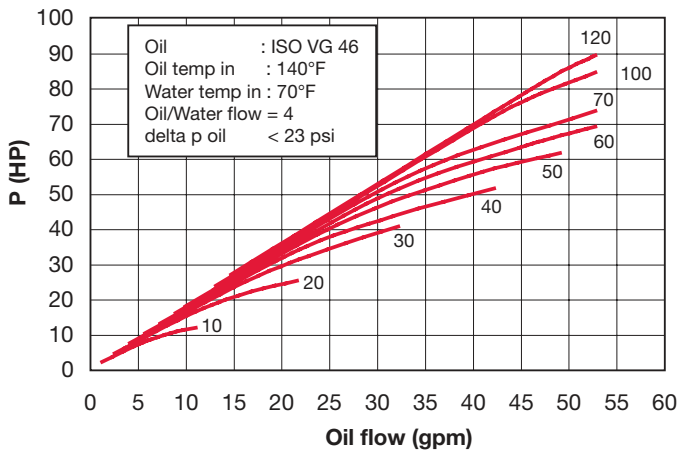
## Pressure Drop Across Heat Exchanger

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	-

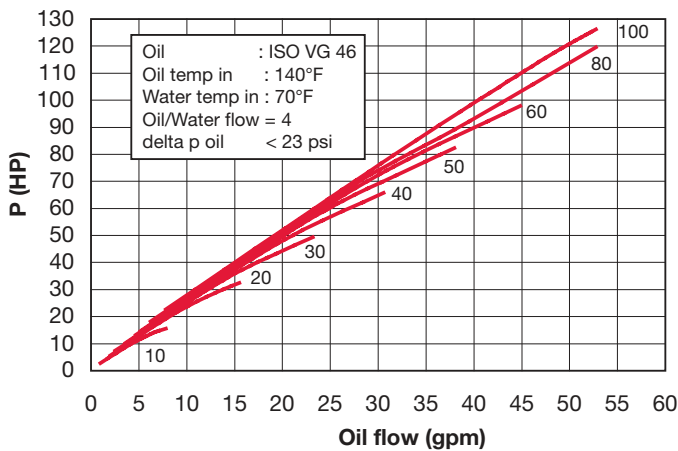
# INDUSTRIAL COOLERS

## Technical Data HEX Size 610



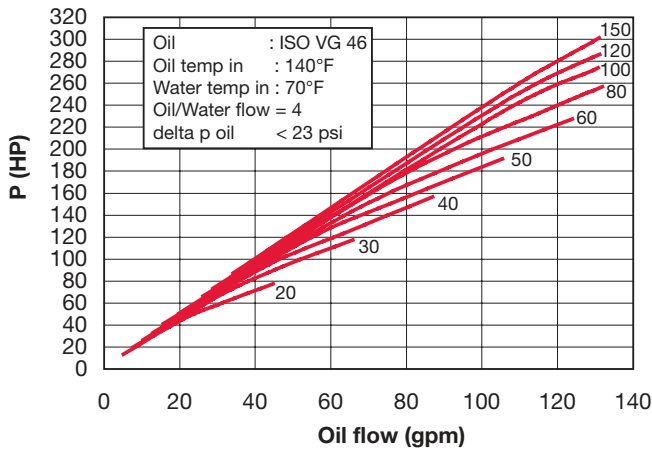
Number of plates (N)	H = 10 + Nx2.4 (mm)	lbs
10	34	5.5
20	58	8.4
30	82	11.2
40	106	14.0
50	130	17.0
60	154	19.8
70	178	22.6
100	250	31.2
120	298	37.0

## HEX 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

## HEX Size 722



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:

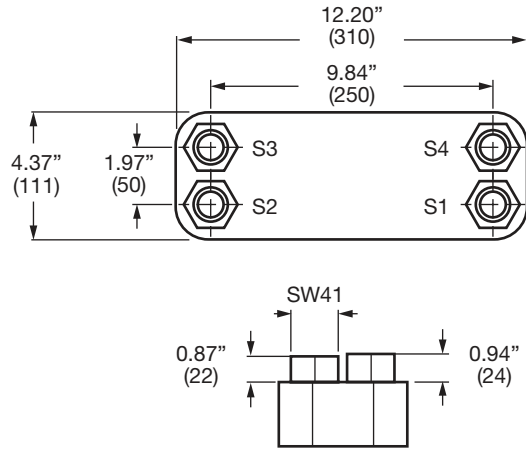
- type of oil
- permissible tank temperature
- required outlet temperature of the oil or necessary cooling capacity
- inlet temperature of the water and maximum water quantity

### Selection Program

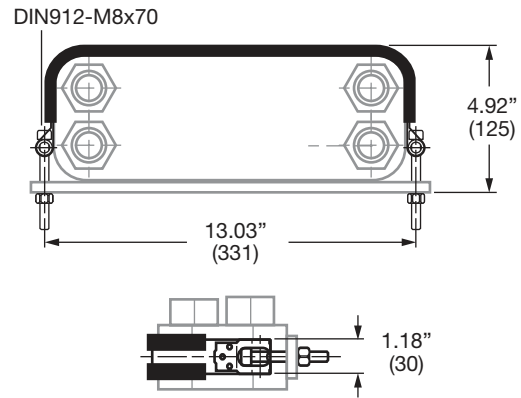
The cooler selection program calculates the correct heat exchanger in the case of non-standard operating data.

Please contact HYDAC Product Group - Cooling System Division

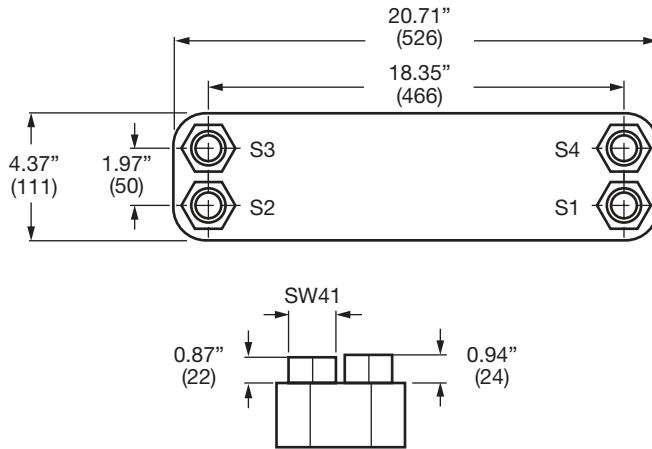
## Dimensions HEX Size 610



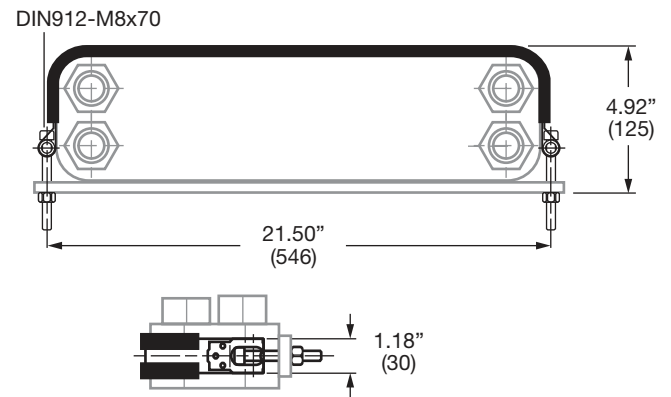
## Mounting Bracket (PN 443281)



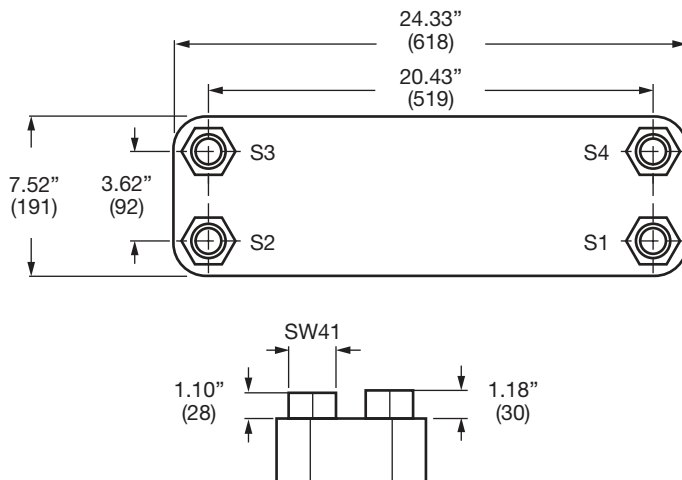
## HEX Size 615



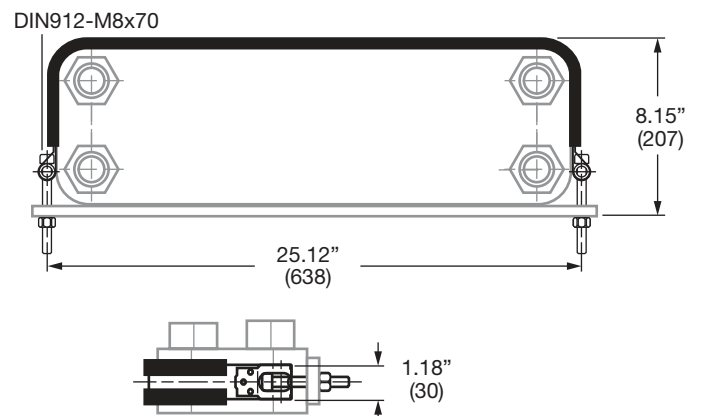
## Mounting Bracket (PN 3014029)



## HEX Size 722



## Mounting Bracket (PN 3013884)



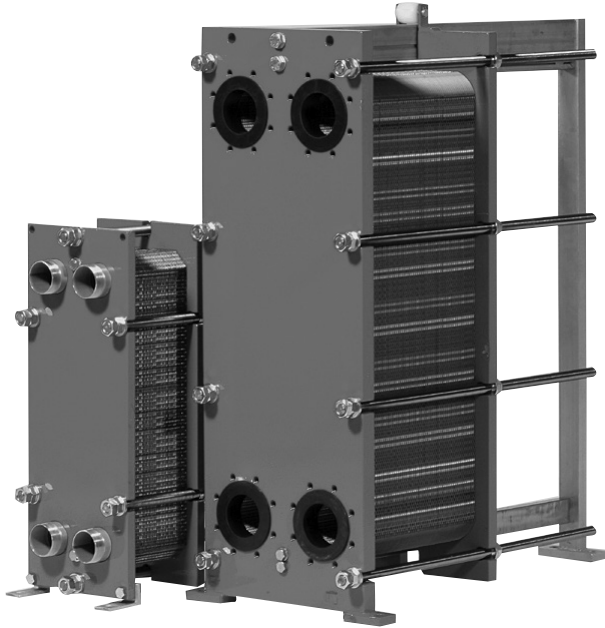
Please note: For mounting heat exchangers with 60 plates and above, two clamps are recommended.

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

# INDUSTRIAL COOLERS

## H Series

### Plate Heat Exchangers



#### 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.

#### Applications



Industrial



Elevators



Gearboxes



Power Generation



Pulp & Paper



Railways

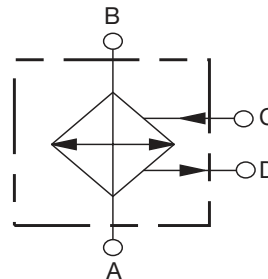


Shipbuilding



Steel / Heavy Industry

#### Hydraulic Symbol



#### 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.

- 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 HYDAC Product Group - Cooling Systems Division.

## Model Code

**H38 - IG 10 - 12 - TKTM 33 - LIQUID**

### Series

H2, H8, H14, H16, H18, H28, H38, H40, H42,  
H44, H62, H82, H84, H94, H128, H128, H172, H220

### Carbon Steel Frame Type

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

### Working Pressure

10 = 150 psi  
16 = 232 psi  
25 = 362 psi

### Number of Plates

XX = Number of plates

### Plate Design

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)

### Thermal Length

### Liquid

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

# INDUSTRIAL COOLERS

## Gasketed Plate Heat Exchanger

### Technical Data Inquiry Sheet

For 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

--



## Comparing Heat Exchanger Performance from HYDAC to other Manufacturers

Not all heat exchangers are rated the same way, especially in terms of heat transfer performance. This guide will help you do a quick comparison all by yourself, essentially allowing you to compare ours to theirs, apples-to-apples.

### Definitions:

- HP = horsepower in terms of the amount of heat transferred (this can be converted to other units of measure, like Btu/min, Btu/hr, kW, etc.)
- ETD = Entering Temperature Differential, hot oil inlet temp minus air inlet temp
- Heat transfer curve is simply a rating of a heat exchanger at various flow rates

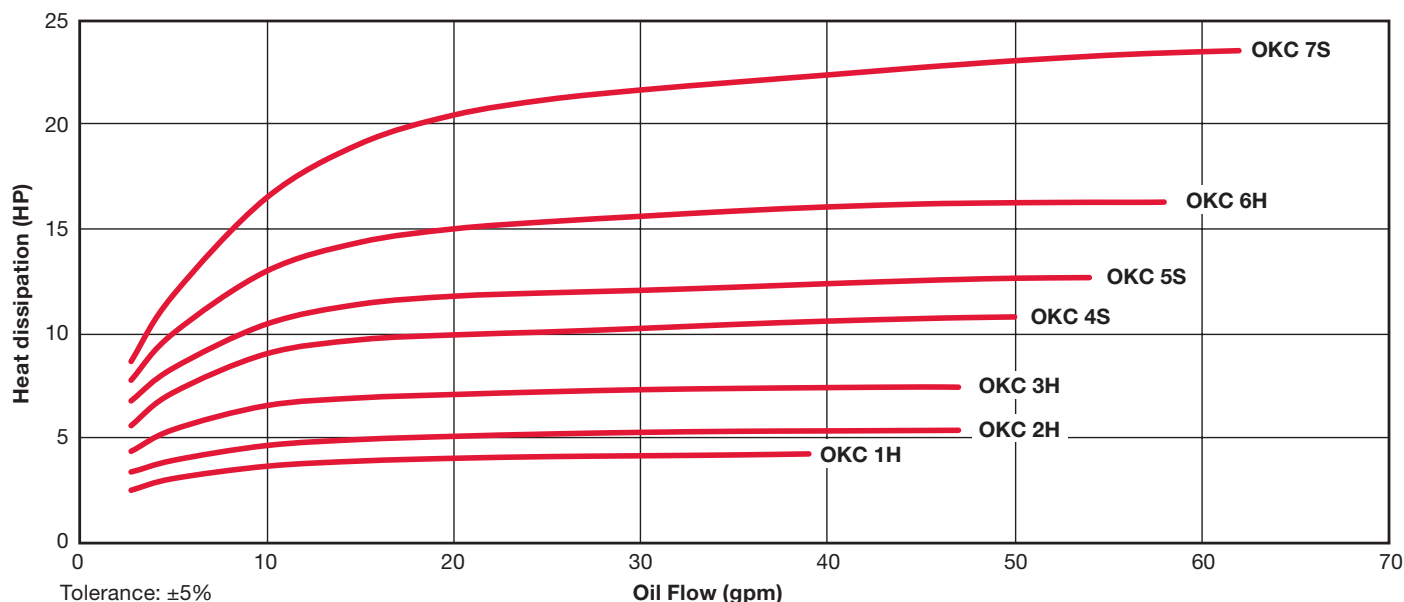
HYDAC rates the industrial coolers at 40°F ETD. This means the oil inlet temp is 40°F hotter than the air inlet temp. We rate the ELD and ELH cooler at 72°F ETD. We rate the ELX series at 100°F ETD to make it easier to compare to our competitors who also rate at 100°F ETD. They are rated differently, but it does not have to be confusing.

Adjusting the HP rating to a different ETD is a simple ratio. You can ratio up or down.

### Example:

Based on the OKC Series Heat Dissipation chart below, our OKC 4S has a rating of 10HP at 40°F ETD at 20 gpm oil flow (it is an easy point to find on the chart). This rating can be stated at a higher (or lower) ETD. For instance, if the competitor's chart is at 50°F ETD, you can adjust the OKC 4S rating:  $10\text{HP} \div 40^\circ\text{F} \times 50^\circ\text{F} = 12.5\text{HP}$ . Therefore, the new OKC 4S rating is 12.5HP at 50°F ETD at 20 gpm. This can be compared to the competitor's cooler rated at 50°F ETD.

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



Cooling capacity is dependent on the oil flow rate and the temperature difference  $\Delta T$  between oil inlet and air inlet.



# Competitive Crossovers

## OKC / OK / ELD / ELH Series

HYDAC	Thermal Transfer	AKG®1	Parker-Hannifin®2 (Olaer®3, Oil Air)	American Industrial	Hayden®4
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	-	-	-	-
ELD1.5M1.5	RM-08-42, RM-08-12	-	-	BM-101, BM-102	-
ELD2M1.5	RM-19-22, RM-19-21	-	-	BM-201, BM-202	-
ELD3M1.5	RM-24-12	-	-	BM-301, BM-302	-
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.**

- 1) Registered trademark of the Autokühler GmbH & Co.
- 2) Parker-Hannifin is a registered trademark of Parker Intangibles, LLC.
- 3) Olaer (Olaer Industries SARL) is a registered trademark of Parker-Hannifin France, SAS.
- 4) Hayden is a registered trademark of the Hayden, Inc. Corporation of California.



# Ordering HYDAC Literature...

HYDAC literature is available for ordering. Email us at [HYD.catalog@hydac-na.com](mailto:HYD.catalog@hydac-na.com) using the appropriate Part Number (PN) and name. Other brochures, manuals and technical documents are also available when ordering from our website.



Overview Brochure  
PN02088157



Filters Catalog  
PN02081318



Accumulators Catalog  
PN02068195



Compact Hydraulics  
Catalog\* (online only)



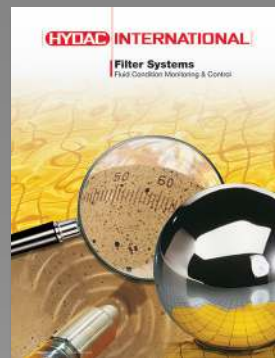
Elec. Sensors & Controls  
Brochure PN2205620



Standard Coolers  
Catalog - PN02085359



Filter Systems Catalog  
PN02075860



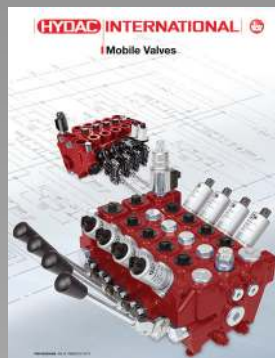
Control Technology\*  
Catalog (online only)



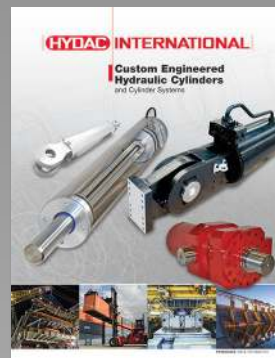
Accessories Catalog  
PN02080105



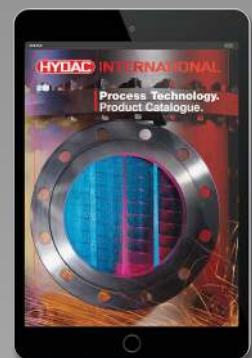
Mobile Valves Brochure  
PN02092408



Hydraulic Cylinders  
Brochure PN2204454



Process Technology\*  
Catalog (online only)



\*These catalogs are digital file versions only.

Various market and product brochures are also available for ordering.



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PN#02085359 / 04.20 / COL1808-2028



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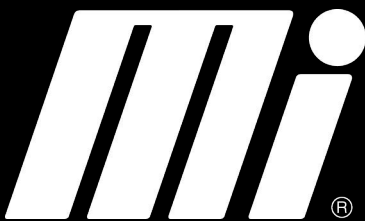
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