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Oil Coolers For Temperature Optimization In Hydraulic Systems

Catalog HY10-1700/Americas



ENGINEERING YOUR SUCCESS.



If you have questions about the products contained in this catalog, or their applications, please contact:



**Accumulator & Cooler
Division - Americas**
phone **815 636 4100**
fax **815 636 4111**
parker.com/accumulator

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NOTE: Failure or improper selection or improper use of coolers or related items can cause death, personal injury and property damage. Parker Hannifin shall not be liable for any incidental, consequential or special damages that result from use of the information contained in this publication.

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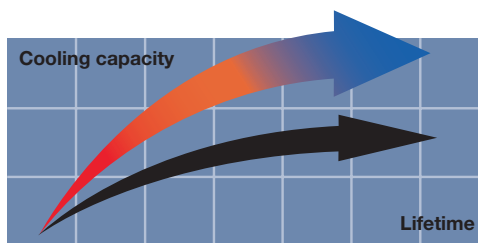
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Parker is a global player specializing in innovative, efficient system solutions for temperature optimization and energy storage. All over the world, our products are working in the most diverse environments and applications.

Oil Coolers

Choosing the right cooler requires precise system sizing. The most reliable way to size a cooler is with the aid of our calculation program. This program, together with precise evaluations from our experienced, skilled engineers, gives you the opportunity for more cooling per \$ invested.



Overheating – an expensive problem

An underestimated cooling capacity produces a temperature that is too high. The consequences are poor lubricating properties, higher internal leakage, a higher risk of cavitation, damaged components, etc. Overheating leads to a significant drop in efficiency which can be detrimental to our environment.

Temperature optimization – a basic prerequisite for cost-efficient operation

Temperature balance in a hydraulic system occurs when the cooler can cool down the energy input that the system does not consume – the system's lost energy ($P_{loss} = P_{cool} = P_{in} - P_{used}$).

Temperature optimization occurs at the temperature at which the oil viscosity is maintained at

recommended values. The correct working temperature produces a number of economic and environmental benefits:

- The hydraulic system's useful life is extended.
- The oil's useful life is extended.
- The hydraulic system's availability increases – more operating time and fewer shutdowns.
- Service and repair costs are reduced.
- High efficiency level maintained in continuous operation – the system's efficiency falls if the temperature exceeds the ideal working temperature.



ULAC with AC Motor

For industrial use – maximum cooling capacity 400 HP*

Optimized design with the right choice of materials and components ensures reliable and long lasting cooling with low service and maintenance costs.

Compact design results in a lighter weight unit with higher cooling capacity and lower pressure drop.

Easy to maintain and easy to retrofit into many applications.

Quiet fan design due to optimization of material and blade.

AC motor – NEMA three phase motors are standard. A wide range of operating voltages and frequencies available.

Cooler core with low pressure drop and high cooling capacity.



ULOC Cooling System

For industrial use – maximum cooling capacity 60 HP

Optimized design and the right choice of materials and components produce a long useful life, high availability and low service and maintenance costs.

Integrated circulation pump produces an even flow with low pressure pulsations.

Easy to maintain and easy to retrofit in many applications.

Compact design and low weight.

Quiet fan and pump.

Cooler core with low pressure drop and high cooling capacity.



ULDC with DC Motor

For mobile use – maximum cooling capacity 40 HP

Optimized design with the right choice of materials and components ensures reliable and long lasting cooling with low service and maintenance costs.

Compact design results in a lighter weight unit with higher cooling capacity and lower pressure drop.

Easy to maintain and easy to retrofit into many applications.

DC motor 12V/24V

Quiet fan and fan motor.



ULHC with Hydraulic Motor

For mobile and industrial use – maximum cooling capacity 215 HP

Optimized design and the right choice of materials and components produce a long useful life, high availability and low service and maintenance costs.

Compact design results in a lighter weight unit with higher cooling capacity and lower pressure drop.

Easy to maintain and easy to retrofit into many applications.

Hydraulic motor with displacement from 8.4 cc/rev to 25.2 cc/rev.

Collar bearing for fan motor on larger models provides longer operating life.

Quiet fan design due to optimization of material and blade.

Cooler core with low pressure drop and high cooling capacity.



OAW Cooling System

For mobile and industrial use – maximum cooling capacity 274 HP

Optimized design and the right choice of materials and components ensures reliable and long lasting cooling with low service and maintenance costs.

Compact design for easy installation.

Turbulent water flow prevents clogging and reduces maintenance.

Low water consumption for economical operation.

SAE O-ring connections for ease of assembly and leak-proof operation.

Maximum material efficiency with no "Dead Zone" outside gaskets.



*At 250 gpm and 70 °F ITD

More Cooling Per \$

with precise calculations and our engineers' support

Optimal sizing produces efficient cooling.

Correct sizing requires knowledge and experience. Our calculation program, combined with our engineers' support, gives you access to this very knowledge and experience. The result is more cooling per \$ invested.

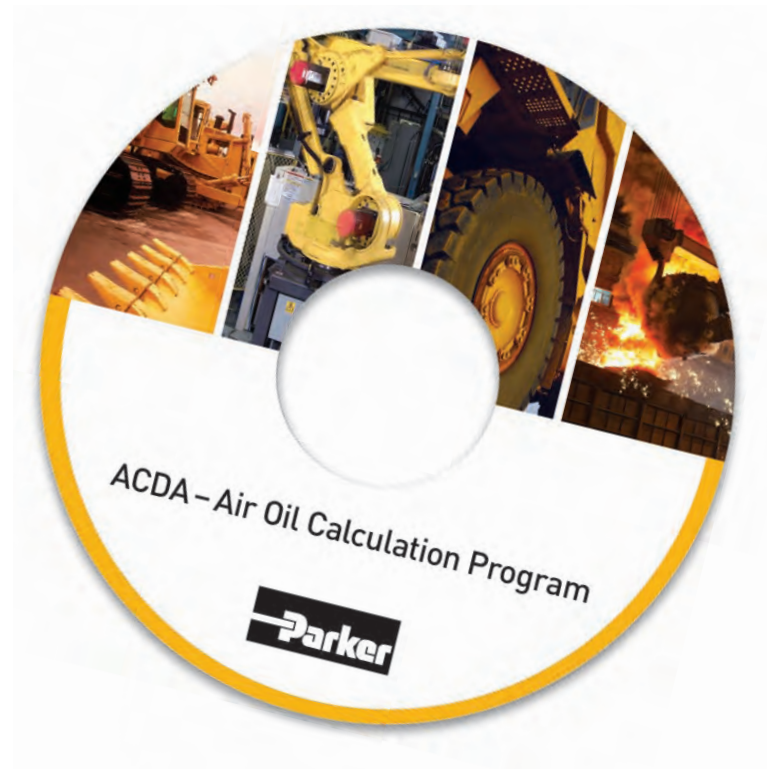
In-depth system review as an added value.

A more wide-ranging review of the hydraulic system is often a natural element of cooling calculations. Other potential system improvements can then be discussed – e.g. filtering, offline or online cooling, etc. Contact us for further guidance and information.

Parker's quality and performance guarantee assures you of maximum system performance and reliability.

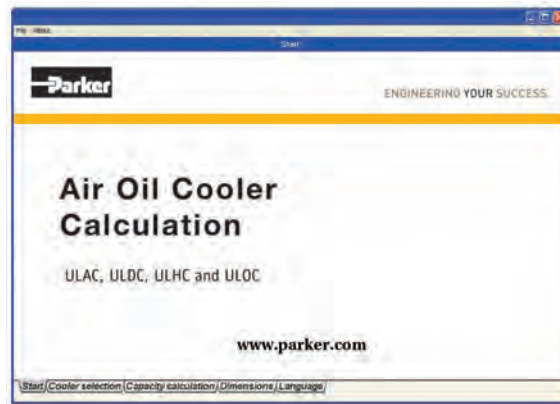
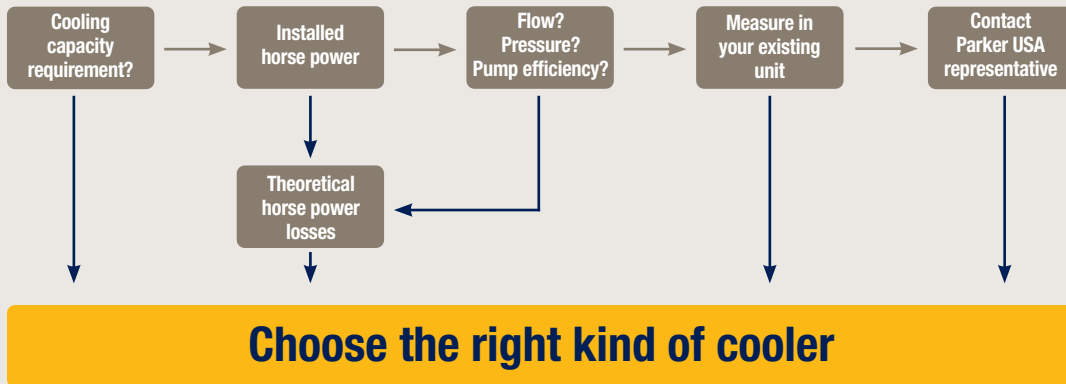
A continual desire for more cost efficient and environmentally friendly hydraulic systems requires continuous development. Areas where we are continuously seeking to improve performance include cooling capacity, noise level, pressure drop and fatigue.

Meticulous quality and performance tests are conducted in our laboratory. All tests and



measurements take place in accordance with standardized methods – cooling capacity in accordance with EN1048, noise level ISO 3743, pressure drop EN 1048 and fatigue ISO 10771-1. For more information about our standardized tests, ask for “Parker’s blue book – a manual for more reliable cooler purchasing.”

Calculate the cooling capacity requirement



Enter your values ...

This section displays three screenshots from the Parker web application. The leftmost screenshot shows the input fields for 'Main flow' (ULDC-011), 'Flow rate' (100 gpm), and 'Pressure' (100 psi). The middle screenshot shows the 'Suggested solution' section, highlighting the 'ULDC-011' model. The rightmost screenshot is a detailed technical drawing of the ULDC-011 cooler, showing its dimensions and a 3D perspective view. The drawing includes labels for various components and dimensions, such as 'ULDC-011', 'ULDC-011 (ULDC-011)', and 'ULDC-011 (ULDC-011)'. The Parker logo is visible in the bottom right corner of the drawing.

... get suggested solution

ULAC with AC Motor

For industrial use – cooling capacity up to 400 HP

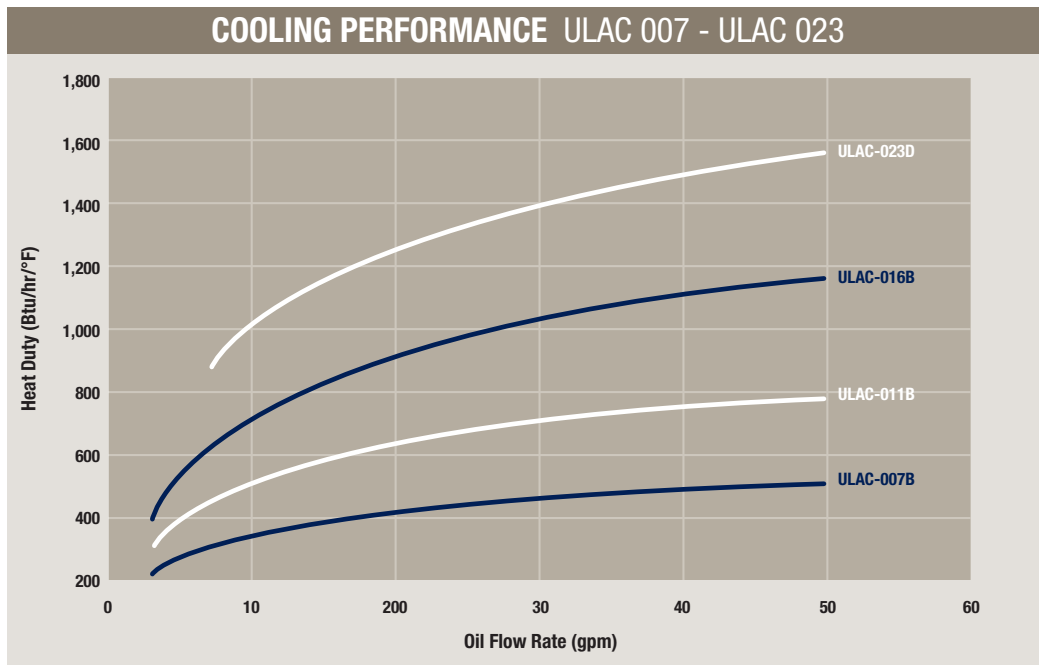


The ULAC oil cooler with AC motor is optimized for use in the industrial sector. Together with a wide range of accessories, the ULAC cooler is suitable for installation in most applications and environments.

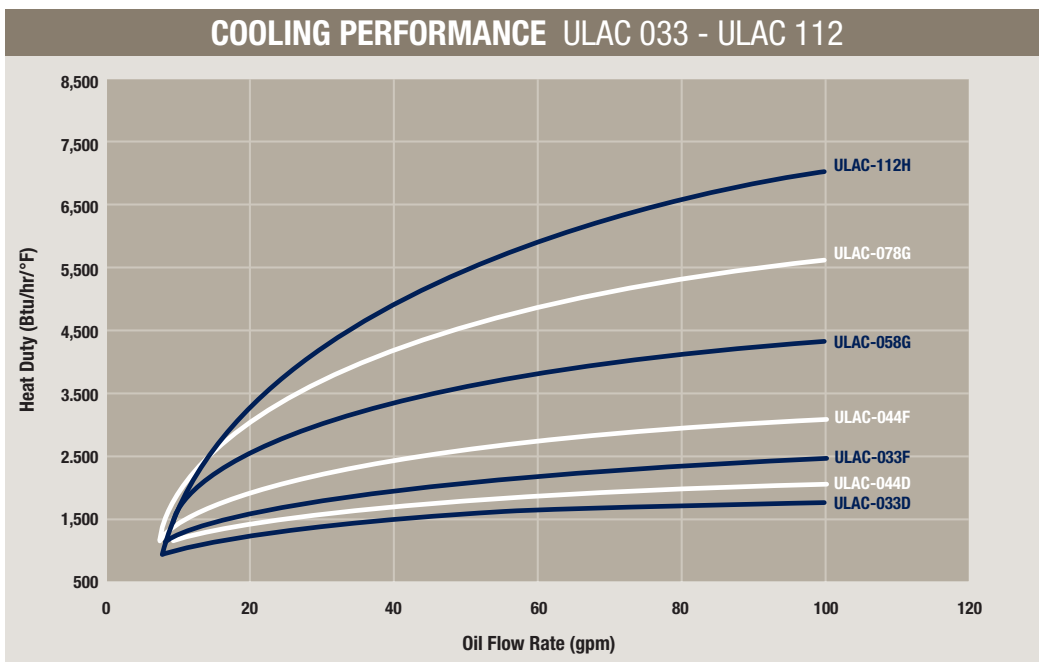
- **Optimized design with right choice of materials and components ensures a reliable and long lasting cooler with low service and maintenance costs.**
- **Compact design resulting in lighter weight unit yet with higher cooling capacity and lower pressure drop.**
- **Easy to maintain and easy to retrofit into many applications.**
- **Quiet fan design due to optimization of material and blade design.**
- **AC motor – NEMA three phase motors are standard. Wide range of operating voltages and frequencies available.**
- **Cooler core with low pressure drop and high cooling capacity.**

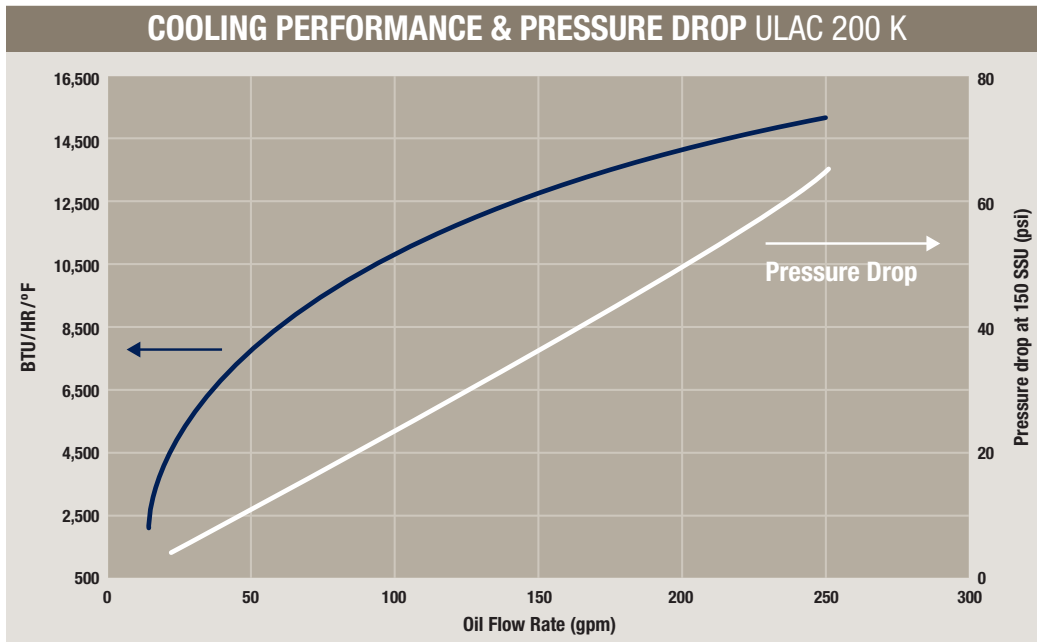
ULAC Cooling Performance

The cooling capacity curves are based on an ETD (Entering Temperature Difference) of 1 °F. For example, oil temperature of 140 °F and air temperature of 70 °F yields a temperature difference of 70 °F. Multiply the number from the cooling graphs corresponding to the specific flow rate by the ETD for the particular application to get the total heat duty.

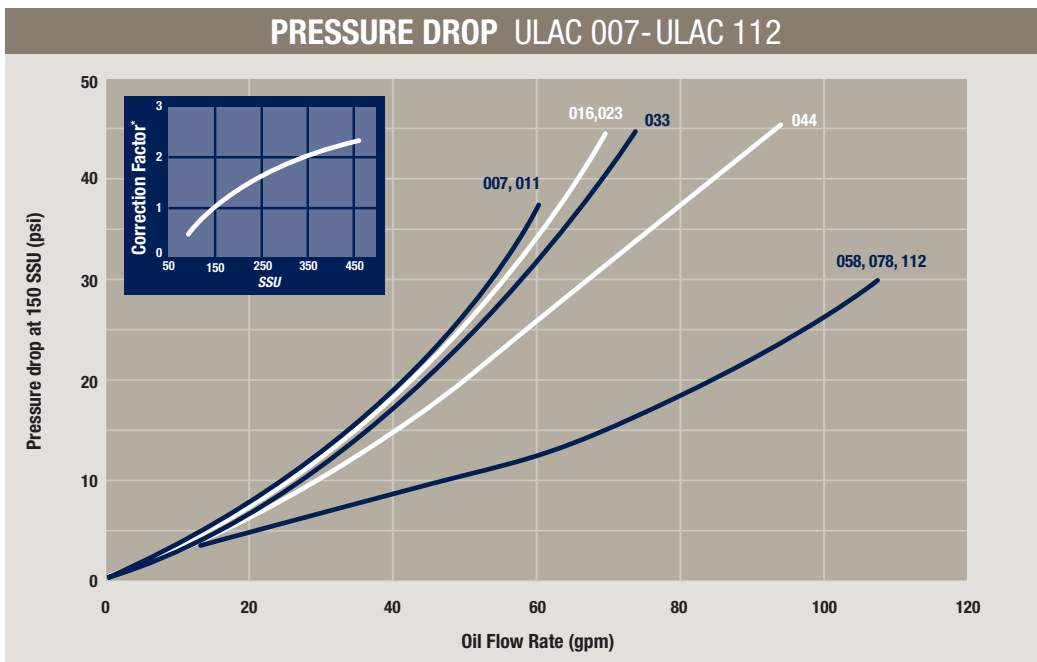


Cooling capacity tolerance ± 10%.

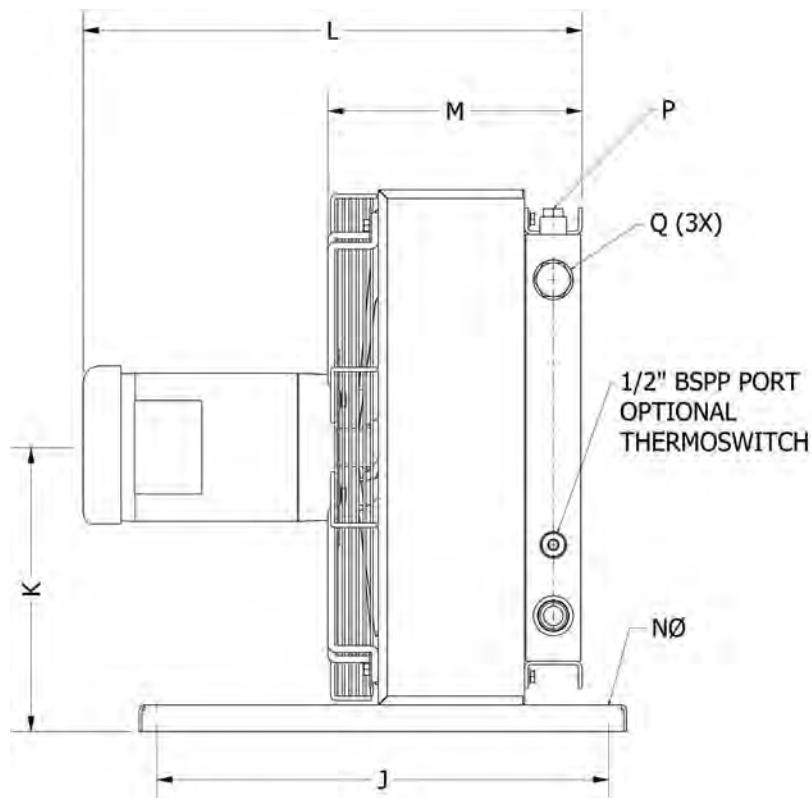




Cooling capacity tolerance $\pm 10\%$.

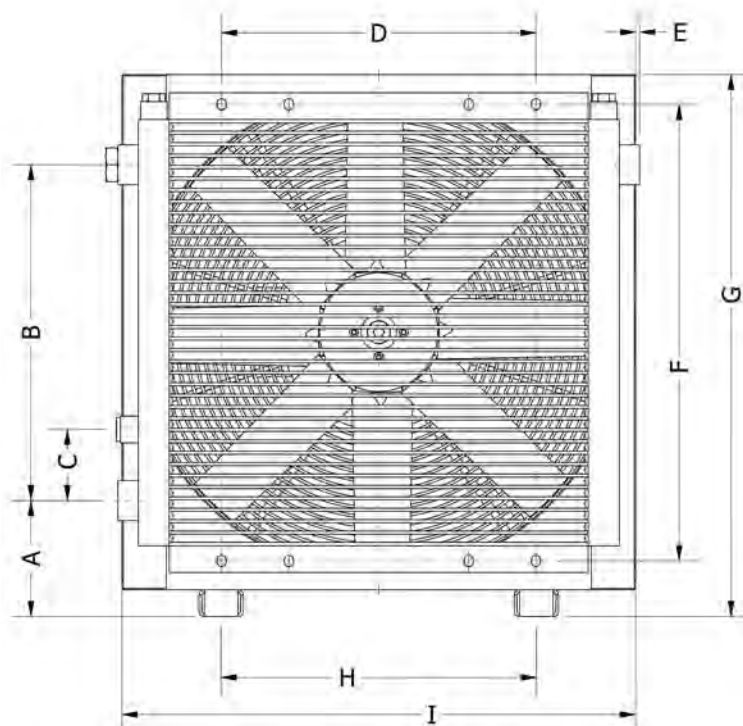


* Pressure Drop Correction Factor for other viscosities.



TYPE	Acoustic Pressure Level <i>L_{pA} dB(A) 3 Ft. *</i>	No. Of Poles/ Capacity <i>HP</i>	Weight <i>Lbs. (Approx.)</i>	P <i>SAE O-Ring</i>	Q <i>SAE O-Ring Boss</i>
ULAC 007B	69	4/0.5	33	1/2" (#8)	1" (#16)
ULAC 011B	71	4/0.5	44	1/2" (#8)	1" (#16)
ULAC 016B	74	4/0.5	53	1/2" (#8)	1" (#16)
ULAC 023D	81	4/1	79	1/2" (#8)	1" (#16)
ULAC 033D	82	4/1	115	1/2" (#8)	1 1/4" (#20)
ULAC 033F	86	4/3	170	1/2" (#8)	1 1/4" (#20)
ULAC 044D	83	4/1	143	1/2" (#8)	1 1/4" (#20)
ULAC 044F	87	4/3	197	1/2" (#8)	1 1/4" (#20)
ULAC 058G	90	4/5	264	3/4" (#12)	1 1/2" (#24)
ULAC 078G	92	4/5	434	3/4" (#12)	1 1/2" (#24)
ULAC 112H	96	4/7.5	542	3/4" (#12)	1 1/2" (#24)
ULAC 200K	93	6/15	1,030	NA	CODE 61 SAE 2" FLANGE

*Noise level tolerance ± 3 dB(A).



TYPE	A	B	C	D	E	F	G	H	I	J	K	L	M	Nø
ULAC 007B	5.2	6.3	3.2	8.0	0.24	11.7	15.6	8.0	14.4	20.1	8.4	19.8	8.8	0.35
ULAC 011B	5.4	9.0	3.2	8.0	0.12	14.3	18.5	8.0	17.3	20.1	9.8	20.8	9.8	0.35
ULAC 016B	5.2	11.7	3.2	8.0	0.28	17.0	20.7	8.0	19.5	20.1	10.9	21.6	10.7	0.35
ULAC 023D	5.2	14.9	3.2	14.0	0.20	20.2	24.0	14.0	22.8	20.1	12.6	22.2	11.3	0.35
ULAC 033D	5.2	19.1	3.2	14.0	NA	24.5	28.4	14.0	27.2	20.1	14.8	23.1	12.5	0.35
ULAC 033F	5.2	19.1	3.2	14.0	NA	24.5	28.4	14.0	27.2	24.0	14.8	25.6	12.5	0.55
ULAC 044D	4.6	26.1	3.2	14.0	NA	31.5	34.1	14.0	27.2	20.1	17.6	24.1	13.3	0.35
ULAC 044F	4.6	26.1	3.2	14.0	NA	31.5	34.1	14.0	27.2	24.0	18.3	26.6	13.5	0.55
ULAC 058G	5.2	26.1	3.2	20.0	NA	31.5	35.4	20.0	34.2	24.0	18.3	29.9	15.2	0.55
ULAC 078G	5.2	32.3	3.9	26.8	NA	38.9	41.4	20.4	40.2	35.4	21.1	30.9	16.2	0.55
ULAC 112H	5.1	38.8	3.9	31.1	0.14	45.4	47.8	23.6	46.7	35.4	24.4	31.9	17.2	0.55
ULAC 200K	7.2	50.9	5.0	49.6	1.2	61.0	64.2	55.9	59.4	35.4	32.7	41.5	18.7	0.71

All dimensions listed above are in inches.

Order Key for ULAC Oil Coolers

All positions must be filled in when ordering.

EXAMPLE:					
ULAC	-	007B	- M	- 100	- SA
Series		Model	Motor Type	Thermoswitch	Core Bypass
1		2	3	4	5
1. OIL COOLER SERIES WITH AC MOTOR; ULAC					
2. COOLER SIZE/MODEL					
007B, 011B, 016B, 023D, 033F, 033D, 044F, 044D, 058G, 078G, 112H and 200K.					
3. MOTOR TYPE					
No motor					= W
Three-phase 190/380V 50 Hz, 208-230/460V 60 Hz					= M*
Three-phase 208-230/460V 60 Hz					= N
Three-phase 230/460V 60 Hz					= P
Three-phase 575V 60 Hz					= Q
Single-phase 115/230V 60 Hz					= R
Single-phase 230 V 60 Hz					= S
Explosion proof, Division 1, Class 1 Group D, Class II Group F & G, T3C					= X
Not listed, consult Accumulator and Cooler Division					= Z
*The M-motor is our standard motor sizes 1 HP and lower. The performance at 50 HZ will be reduced by approximately 10%					
4. THERMOSWITCH					
No thermoswitch					= 000
100 °F					= 100
120 °F					= 120
140 °F					= 140
160 °F					= 160
175 °F					= 175
195 °F					= 195
Not listed, consult Accumulator and Cooler Division					= ZZZ
5. CORE BYPASS*					
No Bypass					= SW
20 psi External Hose Bypass (standard option)					= SA
65 psi External Hose Bypass (standard option)					= SB
30 psi External Tube Bypass					= SG
75 psi External Tube Bypass					= SH
120 psi External Tube Bypass					= SJ
120 °F External Thermo-Bypass					= SM
140 °F External Thermo-Bypass					= SN
160 °F External Thermo-Bypass					= SP
195 °F External Thermo-Bypass					= SQ
Full Flow External Bypass					= SF
*The standard cores are single pass. Two pass cores and other options available upon request, please consult Accumulator and Cooler Division.					

Technical Specifications

FLUID COMBINATIONS	
Mineral oil	
Oil/water emulsion	
Water glycol	
Phosphate ester	
MATERIAL	
Cooler core	Aluminum
Fan blades/hub	Glass fiber reinforced polypropylene/Aluminum
Fan housing	Steel
Fan guard	Steel
Other parts	Steel
Surface treatment	Electrostatically powder-coated
COOLER CORE	
Maximum static working pressure	300 psi
Dynamic working pressure	200 psi*
Heat transfer tolerance	± 6 %
Maximum oil inlet temperature	250 °F
*Tested in accordance with ISO/DIS 10771-1	
COOLING CAPACITY CURVES	
Cooling capacity curves are based on testing in accordance with EN1048 with ISO VG 46.	
CONTACT PARKER FOR ADVICE ON	
Oil temperatures > 250 °F	
Oil viscosity > 100 cSt / 500 SSU	
Aggressive environments	
Environments with heavy airborne particulates	
High-altitude locations	



The information in this brochure is subject to change without prior notice.

ULOC Cooling System

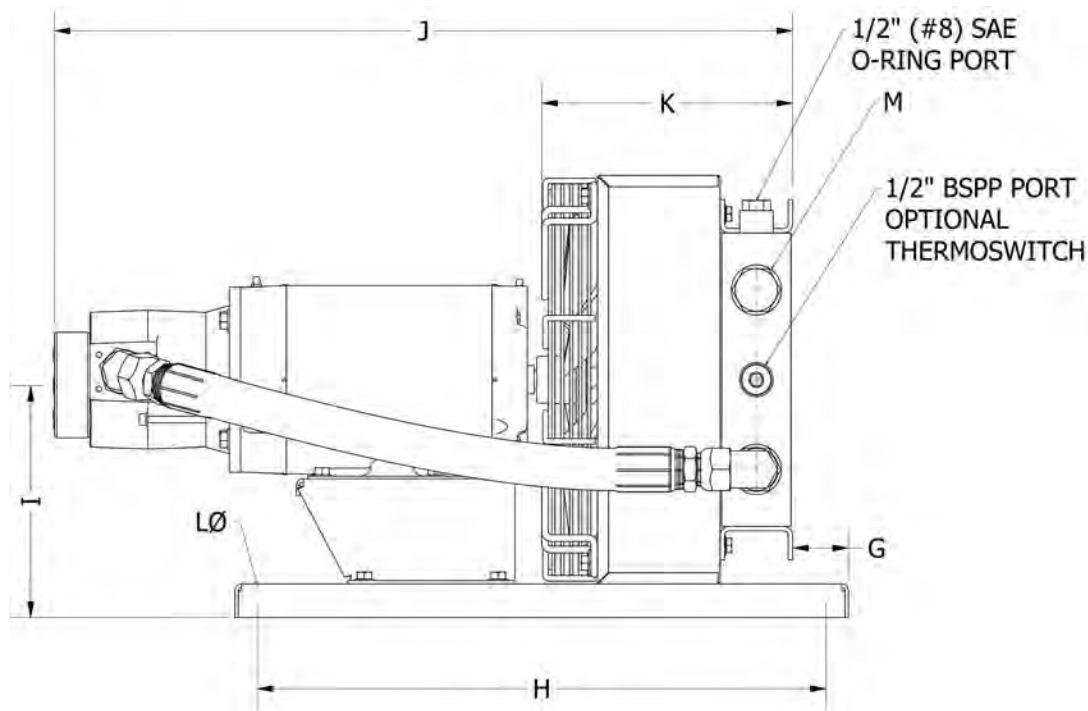
For industrial use – cooling capacity up to 60 HP



The ULOC cooling system with three-phase AC motor is optimized for use in the industrial sector. The system is supplied ready for installation. An integrated circulation pump makes it possible to cool and treat the oil in a separate circuit – offline cooling. Together with a wide range of accessories, the ULOC cooling system is suitable for installation in most applications and environments.

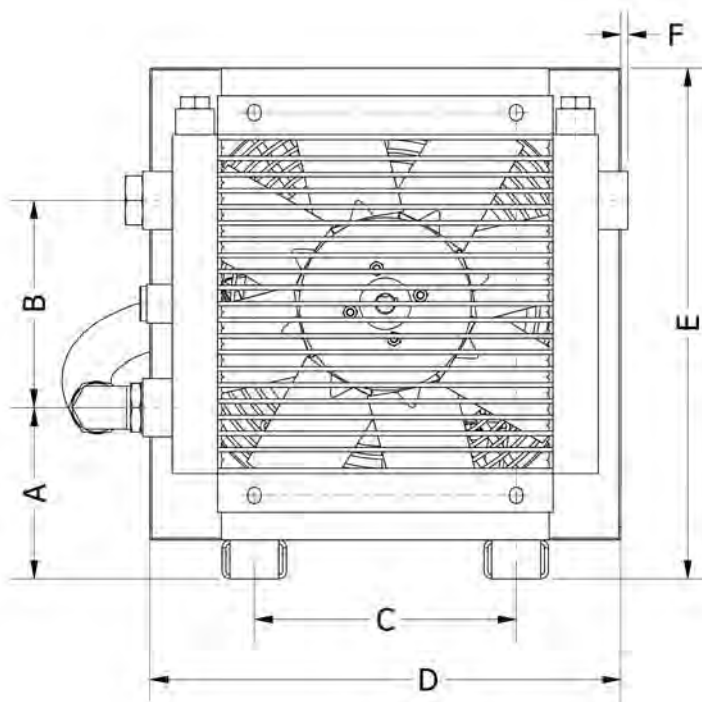
- **Optimized design with right choice of materials and components ensures a reliable and long lasting cooler with low service and maintenance costs.**

- **Integrated circulation pump produces an even flow with low pressure pulsations.**
- **Easy to maintain and easy to retrofit in many applications.**
- **Compact design and low weight.**
- **Quiet fan and fan motor.**
- **Cooler core with low pressure drop and high cooling capacity.**



TYPE	Nom. Oil Flow Rate (gpm)	Cooling Capacity at 50 °F ETD (Btu/hr)	Cooling Capacity Btu/hr °F	Acoustic Pressure Level LpA dB(A) 3 Ft.*	Motor Capacity / No. Of Poles HP	Motor
ULOC 007D - A	6.3	15,500	310	71	1/4	1-4-143TC
ULOC 007D - B	12.7	19,000	380	71	1/4	1-4-143TC
ULOC 007E - C	19.0	21,000	420	72	2/4	2-4-145TC
ULOC 007E - D	25.4	22,500	450	72	2/4	2-4-145TC
ULOC 011D - A	6.3	24,000	480	74	1/4	1-4-143TC
ULOC 011D - B	12.7	28,500	570	74	1/4	1-4-143TC
ULOC 011E - C	19.0	32,000	640	74	2/4	2-4-145TC
ULOC 011E - D	25.4	34,500	690	74	2/4	2-4-145TC
ULOC 016E - A	6.3	33,500	670	78	2/4	2-4-145TC
ULOC 016E - B	12.7	41,000	820	78	2/4	2-4-145TC
ULOC 016E - C	19.0	47,000	940	78	2/4	2-4-145TC
ULOC 016E - D	25.4	50,000	1,000	78	2/4	2-4-145TC
ULOC 023F - B	12.7	60,000	1,200	82	3/4	3-4-182TC
ULOC 023F - C	19.0	65,000	1,300	82	3/4	3-4-182TC
ULOC 023F - D	25.4	70,000	1,400	82	3/4	3-4-182TC
ULOC 033G - C	19.0	80,000	1,600	87	5/4	5-4-182TC
ULOC 033G - D	25.4	90,000	1,800	87	5/4	5-4-184TC
ULOC 044G - C	19.0	95,000	1,900	88	5/4	5-4-182TC
ULOC 044G - D	25.4	105,000	2,100	88	5/4	5-4-182TC

Electric motors specified are calculated for max. Working pressure 90 psi at 125 cSt and 50 Hz, 60 psi at 125 cSt and 60 Hz. If you require higher pressure, please contact us for a choice of motors with a higher output.
 * Noise level tolerance ± 3 dB(A).



TYPE	A	B	C	D	E	F	G	H	I	J	K	Lø	M SAE O-Ring Boss*
ULOC 007D - A	5.2	6.3	8.0	14.4	15.6	0.2	2.0	20.1	8.5	26.1	8.9	0.35	1" (#16)
ULOC 007D - B	5.2	6.3	8.0	14.4	15.6	0.2	2.0	20.1	8.5	26.6	8.9	0.35	1" (#16)
ULOC 007E - C	5.2	6.3	8.0	14.4	15.6	0.2	2.0	20.1	8.5	27.1	8.9	0.35	1" (#16)
ULOC 007E - D	5.2	6.3	8.0	14.4	15.6	0.2	2.0	20.1	8.5	27.6	8.9	0.35	1" (#16)
ULOC 011D - A	5.3	9.0	8.0	17.3	18.5	0.1	2.0	20.1	9.9	27.0	9.9	0.35	1" (#16)
ULOC 011D - B	5.3	9.0	8.0	17.3	18.5	0.1	2.0	20.1	9.6	27.4	9.8	0.35	1" (#16)
ULOC 011E - C	5.4	9.0	8.0	17.3	18.5	0.1	2.0	20.1	9.9	28.0	9.8	0.35	1" (#16)
ULOC 011E - D	5.4	9.0	8.0	17.3	18.5	0.1	2.0	20.1	9.6	28.5	9.8	0.35	1" (#16)
ULOC 016E - A	5.1	11.7	8.0	19.5	20.7	0.3	2.0	20.1	11.0	27.7	10.7	0.35	1" (#16)
ULOC 016E - B	5.1	11.7	8.0	19.5	20.7	0.3	2.0	20.1	11.0	28.2	10.7	0.35	1" (#16)
ULOC 016E - C	5.1	11.7	8.0	19.5	20.7	0.3	2.0	20.1	11.0	28.8	10.7	0.35	1" (#16)
ULOC 016E - D	5.1	11.7	8.0	19.5	20.7	0.3	2.0	20.1	10.7	29.3	10.7	0.35	1" (#16)
ULOC 023F - B	5.2	14.9	14.0	22.8	24.0	0.2	2.0	24.0	12.4	30.7	11.3	0.55	1" (#16)
ULOC 023F - C	5.1	14.9	14.0	22.8	24.0	0.2	2.0	24.0	12.4	31.2	11.3	0.55	1" (#16)
ULOC 023F - D	5.1	14.9	14.0	22.8	24.0	0.2	2.0	24.0	12.4	31.7	11.3	0.55	1" (#16)
ULOC 033G - C	5.2	19.1	14.0	27.2	28.4	-	2.4	24.0	14.6	32.7	12.5	0.55	1¼" (#20)
ULOC 033G - D	5.2	19.1	14.0	27.2	28.4	-	2.4	24.0	14.9	33.2	12.5	0.55	1¼" (#20)
ULOC 044G - C	4.5	26.1	14.0	27.2	34.1	-	2.0	24.0	17.4	33.6	13.5	0.55	1¼" (#20)
ULOC 044G - D	4.5	26.1	14.0	27.2	34.1	-	2.0	24.0	17.4	33.9	13.5	0.55	1¼" (#20)

* Port on the inlet side of the pump is 1½" (#24) SAE O-ring Boss for all models.
All dimensions listed above are in inches.

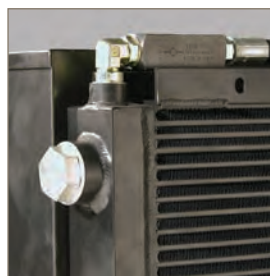
Order Key for ULOC Cooling Systems

All positions must be filled in when ordering.

EXAMPLE:					
ULOC	-	007D	- M	- A	- SA
Series		Model	Motor Type	Pump Flow Rate	Core Bypass
1		2	3	4	5
1. OIL COOLER SERIES OFFLINE, WITH PUMP; ULOC					
2. COOLER SIZE/MODEL					
007D, 007E, 011D, 011E, 016E, 023F, 033G, 044G					
3. MOTOR TYPE					
No motor					= W
Three phase, 190/380V 50 Hz, 208-230/460V 60Hz					= M
Three phase, 575V 60Hz					= Q
Not listed, consult Accumulator and Cooler Division					= Z
<i>Performance at 50 Hz will be reduced by approximately 10%</i>					
4. PUMP FLOW RATE (GPM)					
6					= A
12					= B
19					= C
25					= D
5. CORE BYPASS*					
No Bypass					= SW
20 psi External Hose Bypass (<i>standard option</i>)					= SA
65 psi External Hose Bypass (<i>standard option</i>)					= SB
30 psi External Tube Bypass					= SG
75 psi External Tube Bypass					= SH
120 psi External Tube Bypass					= SJ
120 °F External Thermo-Bypass					= SM
140 °F External Thermo-Bypass					= SN
160 °F External Thermo-Bypass					= SP
195 °F External Thermo-Bypass					= SQ
<i>*The standard cores are single pass. Two pass cores and other options available upon request, please consult Accumulator and Cooler Division.</i>					

Technical Specifications

COOLER CORE	
Maximum static working pressure	300 psi
Dynamic working pressure	200 psi*
Heat transfer tolerance	± 6 %
Maximum oil inlet temperature	250 °F
<i>* Tested in accordance with ISO/DIS 10771-1</i>	
<ul style="list-style-type: none"> ULOC is designed primarily for synthetic oils, vegetable oils and mineral oil type HL/HLP in accordance with DIN 51524. Maximum oil temperature 210 °F. Maximum negative pressure in the inlet line is 6 psi with an oil-filled pump. Maximum pressure on the pump's suction side is 8 psi. Maximum working pressure for the pump is 150 psi. 	
Heat transfer tolerance	± 6 %
MATERIAL	
Cooler core	Aluminum
Fan blades/hub	Glass fiber reinforced polypropylene/ Aluminum
Fan housing	Steel
Fan guard	Steel
Pump housing	Aluminum
Other parts	Steel
Surface treatment	Electrostatically powder-coated
CONTACT PARKER FOR ADVICE ON	
Oil temperatures > 250 °F	
Oil viscosity > 100 cSt / 500 SSU	
Aggressive environments	
Environments with heavy airborne particulates	
High-altitude locations	



Bypass Valve



Stone Guard

The information in this brochure is subject to change without prior notice.

ULDC With DC Motor

For mobile use – cooling capacity up to 40 HP

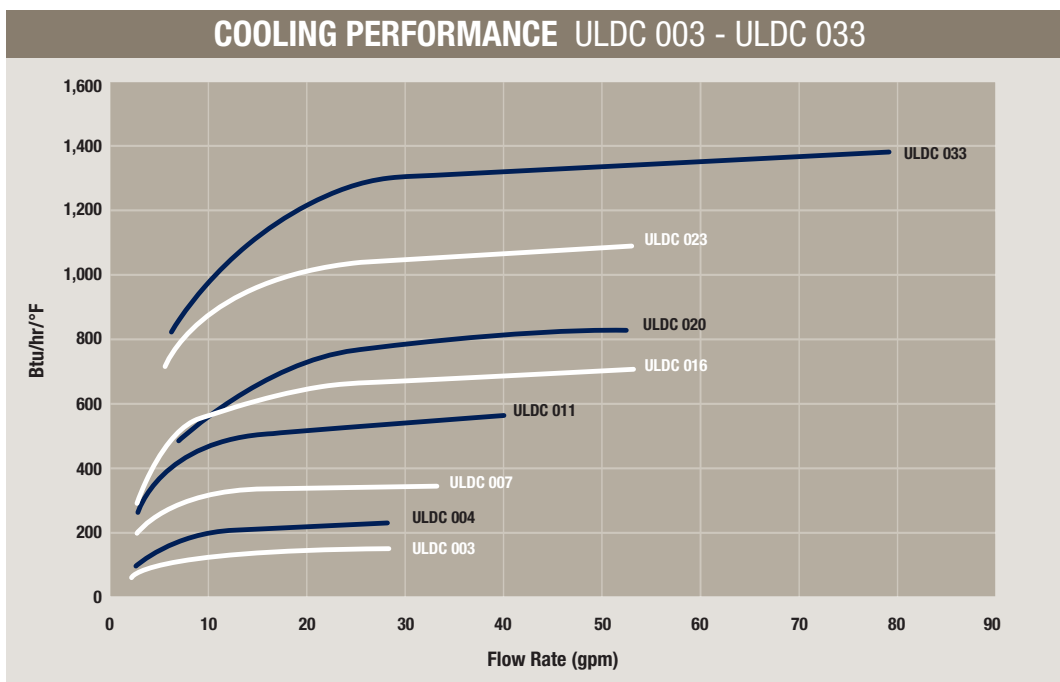


The ULDC oil cooler with 12 or 24V DC motor is optimized for use in the mobile industry. Together with a wide range of accessories, the ULDC cooler is suitable for installation in most applications and environments.

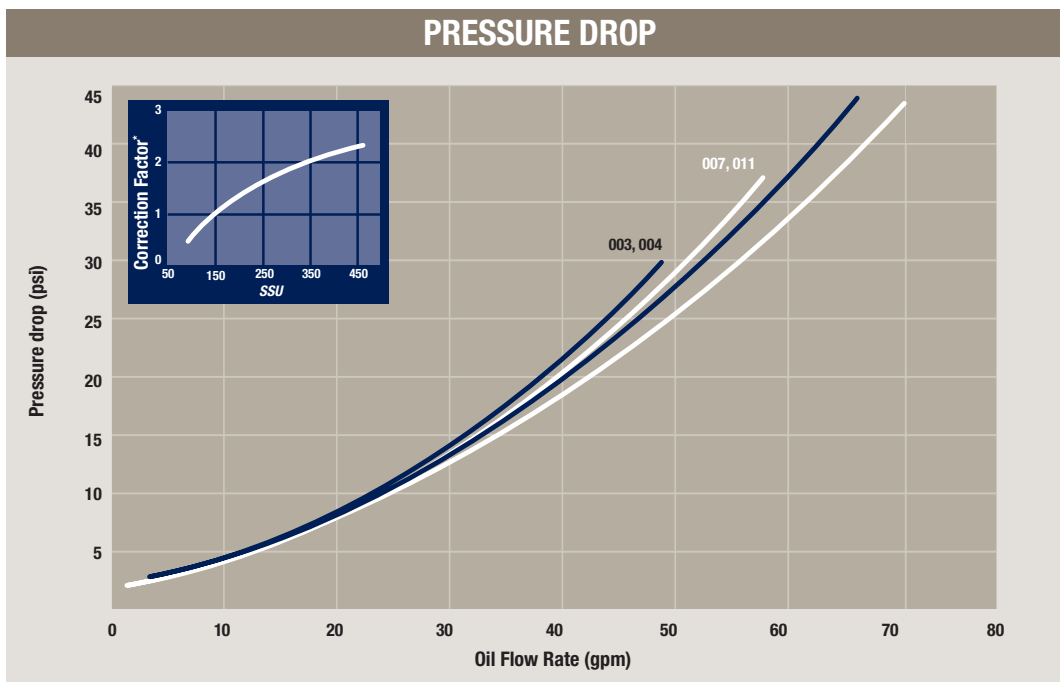
- **Optimized design with right choice of materials and components ensures a reliable and long lasting cooler with low service and maintenance costs.**
- **Compact design resulting in lighter weight unit yet with higher cooling capacity and lower pressure drop.**
- **Easy to maintain and easy to retrofit into many applications.**
- **DC motor 12V/24V.**
- **Quiet fan and fan motor.**

ULDC Cooling Performance

The cooling capacity curves are based on an ETD (Entering Temperature Difference) of 1 °F. For example, oil temperature of 140 °F and air temperature of 70 °F yields a temperature difference of 70 °F. Multiply the number from the cooling graphs corresponding to the specific flow rate by the ETD for the particular application to get the total heat duty.



Cooling capacity tolerance ± 10%.



* Pressure Drop Correction Factor for other viscosities.