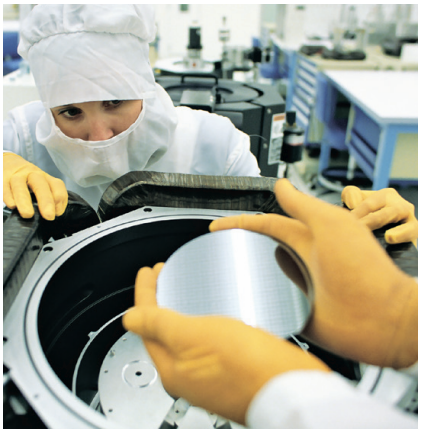
# Air Oil Coolers

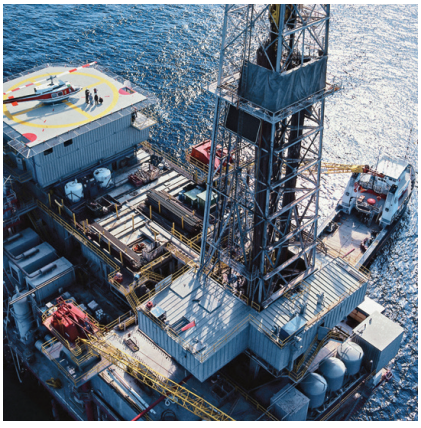
The LAC air oil cooler, with single-phase or three-phase AC motor, is optimised for use in the industrial sector. The maximum cooling capacity is 300kW at ETD +40ºC.

**Maximum Working Temperature:**
+120°C

**Maximum Static Working Pressure:**
21 bar

**Maximum Dynamic Working Pressure:**
14 bar





| | LAC Range (In-line Cooler) |
|---|---|
| LAC-1 | LAC2-002-2-C-00-000-0-0 |
| LAC-2 | LAC2-007-4-D-00-000-0-0 |
| LAC-3 | LAC2-011-4-D-00-000-0-0 |
| LAC-4 | LAC2-016-4-D-00-000-0-0 |
| LAC-5 | LAC2-023-4-D-00-000-0-0 |
| LAC-6 | LAC-044-4-A-00-000-0-0 |
| LAC-7 | LAC-078-6-A-00-000-0-0 |

The Olaer Group has been part of Parker Hannifin since July 1st, 2012. With manufacturing and sales in 14 countries in North America, Asia and Europe, the Olaer Group expands Parker's presence in geographic growth areas and offers expertise in hydraulic accumulator and cooling systems for target growth markets such as oil and gas, power generation and renewable energy.

# LAC Air Oil Coolers

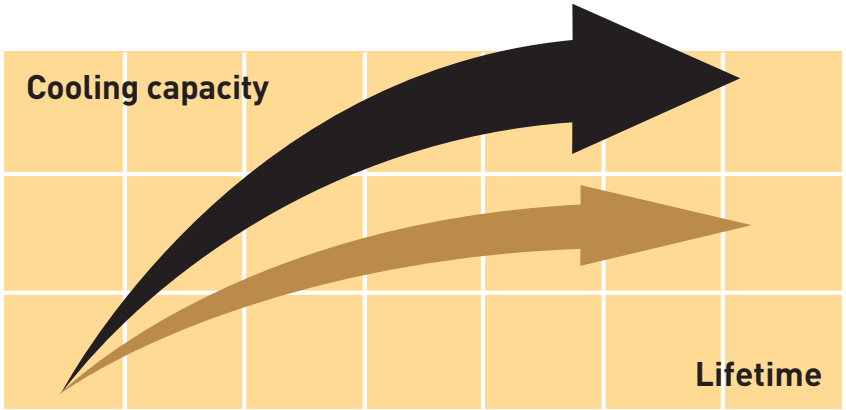
## For industrial use – maximum cooling capacity 300 kW

The LAC air oil cooler with single-phase or three-phase AC motor is optimized for use in the industrial sector. Together with a wide range of accessories, the LAC cooler is suitable for installation in most applications and environments. The maximum cooling capacity is 300 kW at ETD 40 °C. Choosing the right cooler requires precise system sizing. The most reliable way to size 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 under-sized cooling capacity produces a temperature balance that is too high. The consequences are poor lubricating properties, internal leakage, a higher risk of cavitation, damaged components, etc. Overheating leads to a significant drop in cost-efficiency and environmental consideration.

**Temperature optimisation - 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:
(Ploss = Pcool = Pin – Pused).
Temperature optimisation means that temperature balance occurs at the system's ideal working temperature – the temperature at which the oil's viscosity and the air content comply with 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.**



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

Easy to maintain and easy to retrofit in many applications.

Compact design and light weight.


Quiet fan and fan motor.

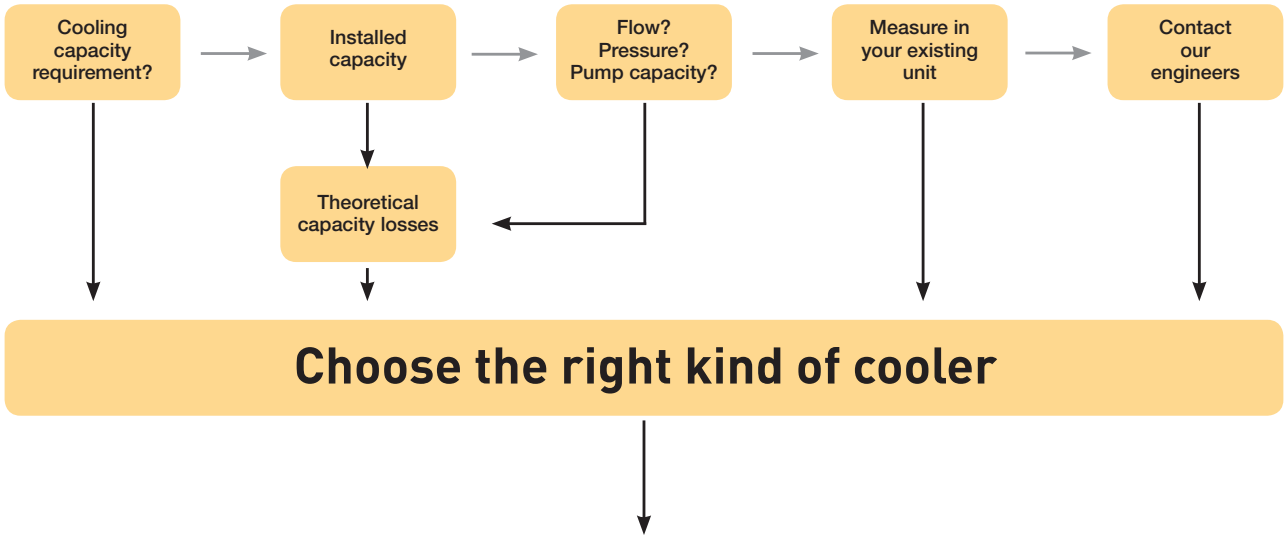
AC motor single-phase for smaller and three-phase for larger cooler sizes.

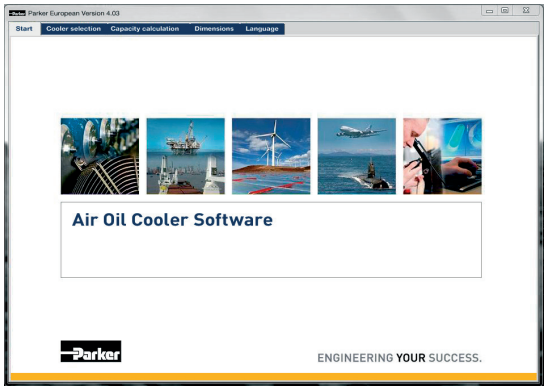
Cooler matrix with low pressure drop and high cooling capacity.

# LAC-M and LAC-X

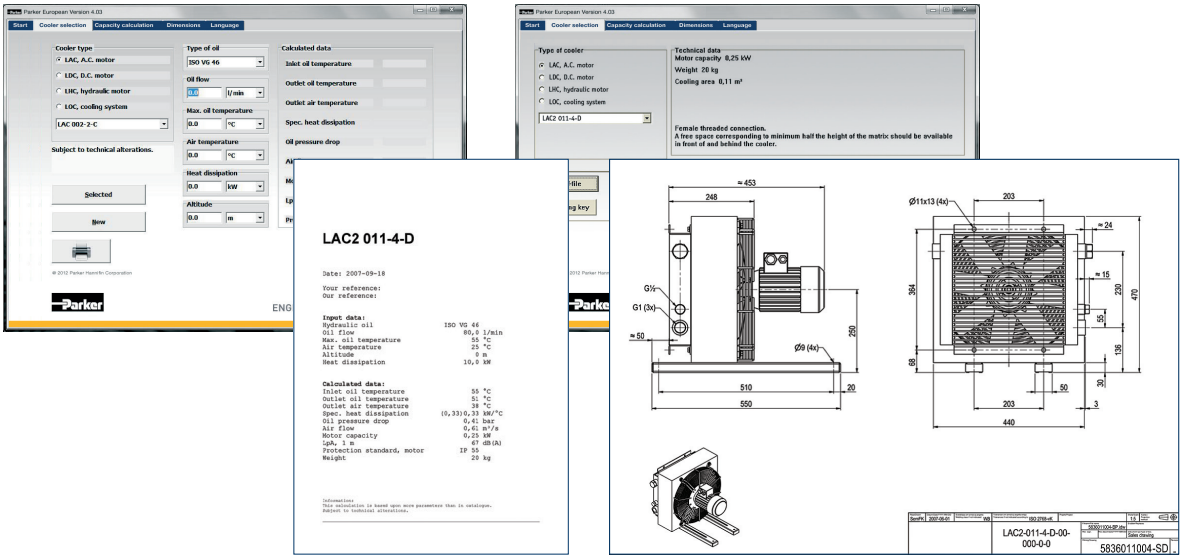
LAC air oil coolers are also available in two special versions, LAC-X (ATEX version), approved for applications where there may be an explosive environment above ground, and LAC-M, adapted to be better able to deal with corrosion attacks, for example in marine environments.

# Calculate the Cooling Capacity Requirement

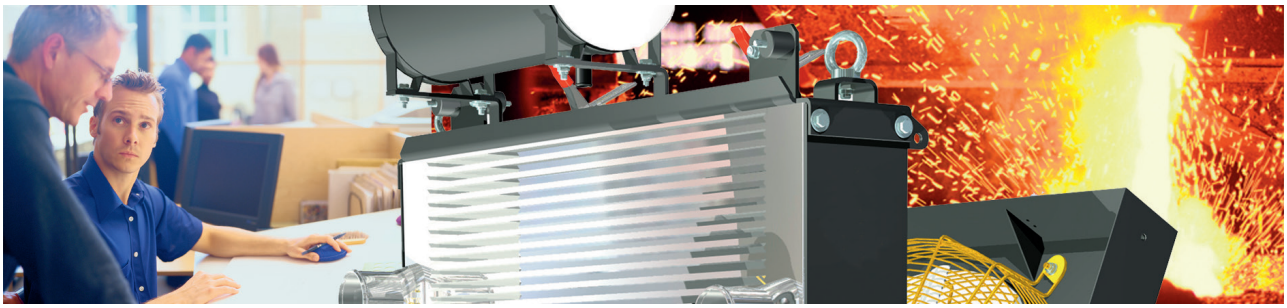



Enter your values ....




... suggested solution



Better energy consumption means not only less environmental impact, but also reduces operating costs, i.e. more cooling per € invested.

# More Cooling per €

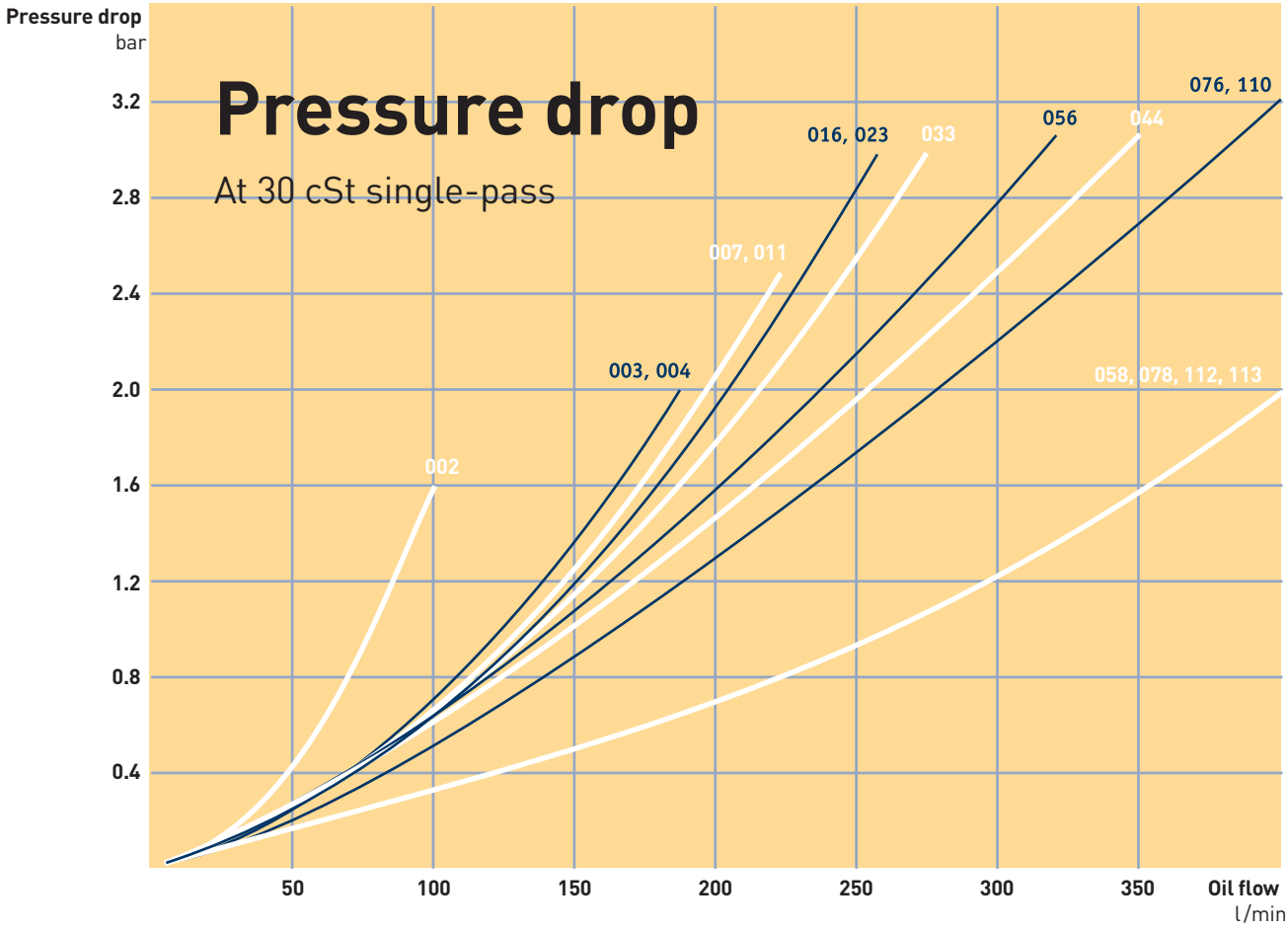
## with precise calculations and our engineers' support

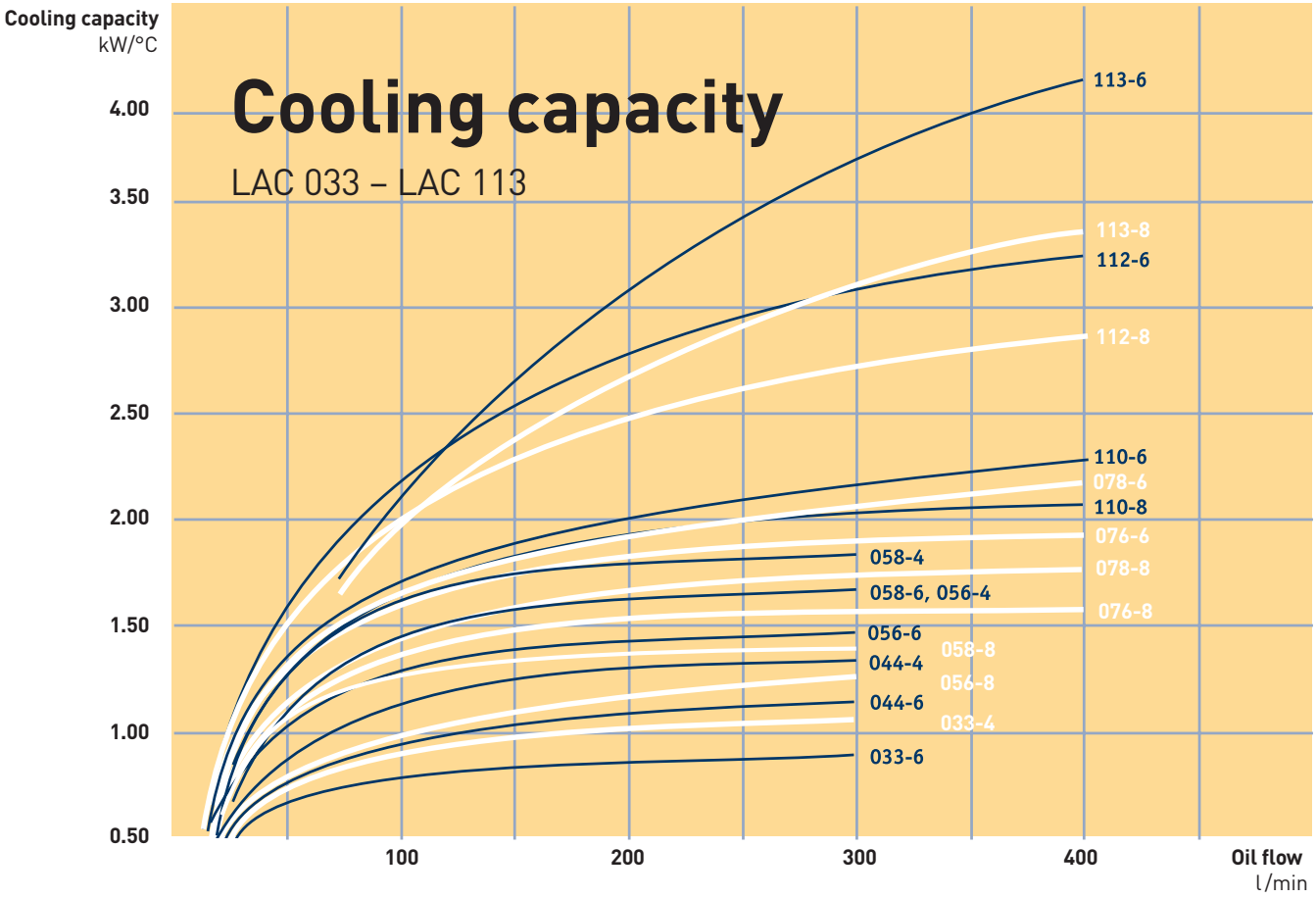
Optimal sizing produces efficient cooling. Correct sizing requires knowledge and experience. Our calculation program, combined with our engineers' support, gives you access to this very knowledge and experience. The result is more cooling per € invested. The user-friendly calculation program can be downloaded from www.parker.com/acde.

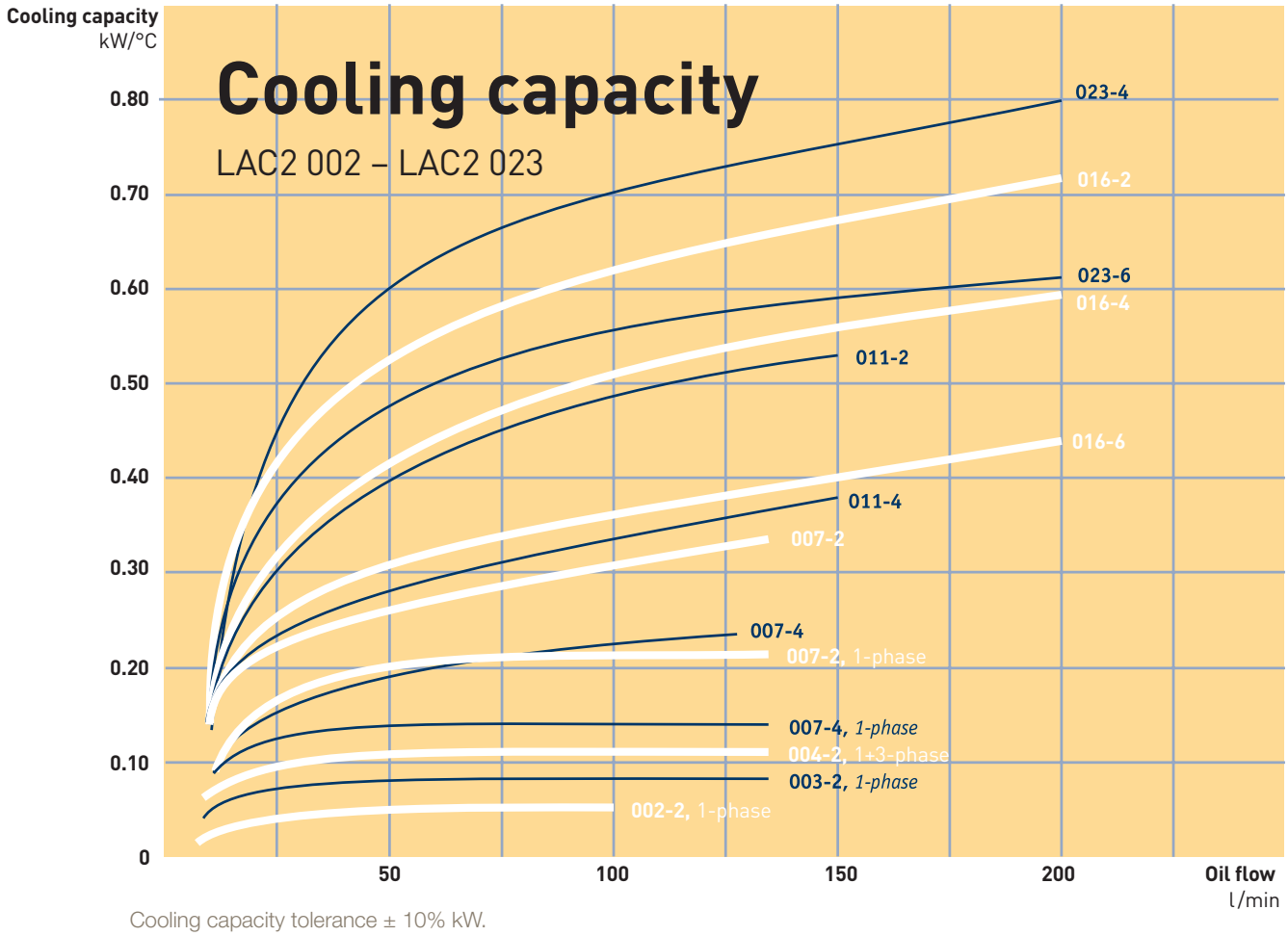
**Valuable system review into the bargain**
A more wide-ranging review of the hydraulic system is often a natural element of cooling calculations. Other potential system improvements can then be discussed – e.g. filtering, offline or online cooling, etc. Contact us for further guidance and information.

**Parker Hannifin's quality and performance guarantee insurance for your operations and systems**
A constant striving towards more cost-efficient and environment 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 standardised methods - cooling capacity in accordance with EN1048, noise level ISO 3743, pressure drop EN 1048 and fatigue ISO 10771-1.

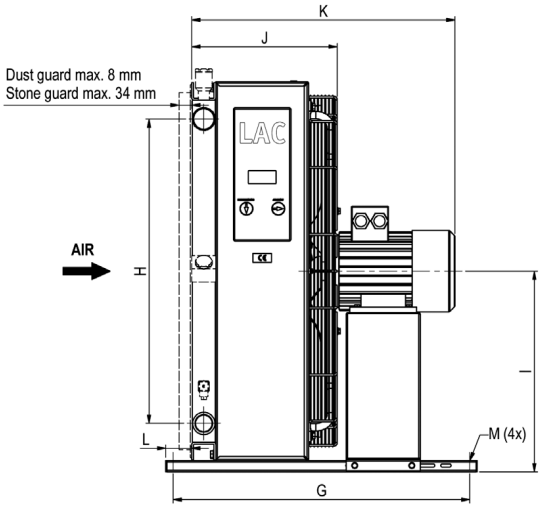

The cooling capacity curves are based on the inlet oil temperature and the ambient air temperature. An oil temperature of 60 °C and an air temperature of 20 °C produce a temperature difference of 40 °C. Multiply by kW/°C for total cooling capacity.





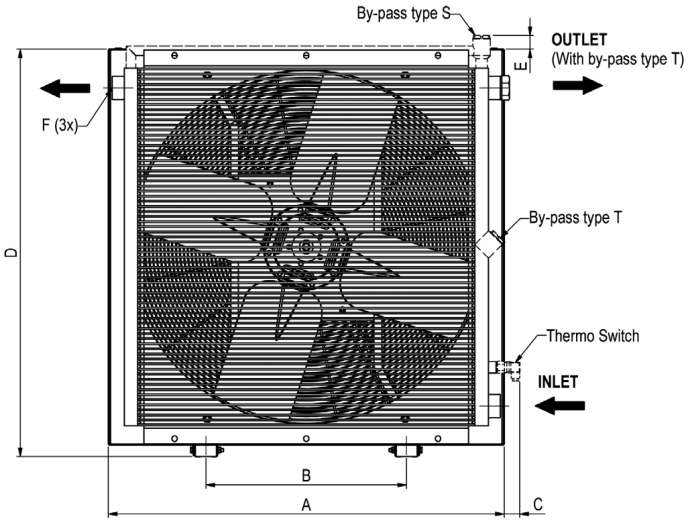

Cooling capacity tolerance ± 10% kW.




| TYPE | | Acoustic pressure level LpA dB(A) 1m* | No. of poles/ Capacity kW | Weight kg (approx) |
|---|---|---|---|---|
| LAC2 | 002-2-single-phase | 50 | 2-0.05 | 4 |
| LAC2 | 003-2-single-phase | 61 | 2-0.05 | 5 |
| LAC2 | 004-2-single-phase | 63 | 2-0.07 | 6 |
| LAC2 | 004-2-single-phase | 63 | 2-0.07 | 6 |
| LAC2 | 007-4-single-phase | 65 | 2-0.08 | 9 |
| LAC2 | 007-2-single-phase | 79 | 2-0.24 | 10 |
| LAC2 | 007-4-three-phase | 62 | 4-0.25 | 15 |
| LAC2 | 007-2-three-phase | 79 | 2-0.55 | 16 |
| LAC2 | 011-4-three-phase | 67 | 4-0.25 | 20 |
| LAC2 | 011-2-three-phase | 82 | 2-1.10 | 25 |
| LAC2 | 016-6-three-phase | 60 | 6-0.18 | 23 |
| LAC2 | 016-4-three-phase | 70 | 4-0.37 | 24 |
| LAC2 | 016-2-three-phase | 86 | 2-1.10 | 27 |
| LAC2 | 023-6-three-phase | 64 | 6-0.18 | 35 |
| LAC2 | 023-4-three-phase | 76 | 4-0.75 | 36 |
| LAC | 033-6-three-phase | 74 | 6-0.55 | 45 |
| LAC | 033-4-three-phase | 84 | 4-2.20 | 52 |
| LAC | 044-6-three-phase | 76 | 6-0.55 | 63 |
| LAC | 044-4-three-phase | 85 | 4-2.20 | 65 |
| LAC | 056-8-three-phase | 73 | 8-0.75 | 73 |
| LAC | 056-6-three-phase | 81 | 6-1.50 | 75 |
| LAC | 056-4-three-phase | 84 | 4-3.0 | 75 |
| LAC | 058-8-three-phase | 74 | 8-0.75 | 80 |
| LAC | 058-6-three-phase | 82 | 6-1.50 | 82 |
| LAC | 058-4-three-phase | 85 | 4-3.0 | 82 |
| LAC | 076-8-three-phase | 79 | 8-1.10 | 130 |
| LAC | 076-6-three-phase | 86 | 6-2.20 | 140 |
| LAC | 078-8-three-phase | 80 | 8-1.10 | 136 |
| LAC | 078-6-three-phase | 87 | 6-2.20 | 146 |
| LAC | 110-8-three-phase | 84 | 8-2.20 | 160 |
| LAC | 110-6-three-phase | 90 | 6-5.50 | 170 |
| LAC | 112-8-three-phase | 85 | 8-2.20 | 168 |
| LAC | 112-6-three-phase | 91 | 6-5.50 | 178 |
| LAC | 113-8-three-phase | 80 | 8-2.20 | 218 |
| LAC | 113-6-three-phase | 88 | 6-5.50 | 237 |
| LAC | 200-8-three-phase | 86 | 8-4.00 | 365 |
| LAC | 200-6-three-phase | 92 | 6-11.00 | 405 |

* = Noise level tolerance ± 3 dB(A).

OUTLET
(With by-pass type S)




| TYPE | | A | B | C | D | E | F | G | H | I | J | K | L | Mø |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LAC2 | 002-2-single-phase | 165 | 74 | 82 | 189 | - | G½ | 190 | 72 | 97 | 105 | 167 | 39 | 9 |
| LAC2 | 003-2-single-phase | 244 | 134 | 82 | 223 | 71 | G1 | 148 | 90 | 114 | 161 | 218 | 31 | 9x14 |
| LAC2 | 004-4-single-phase | 267 | 134 | 82 | 256 | 69 | G1 | 148 | 90 | 131 | 165 | 222 | 28 | 9x14 |
| LAC2 | 004-2-single-phase | 267 | 134 | 82 | 256 | 69 | G1 | 148 | 90 | 131 | 165 | 222 | 28 | 9x14 |
| LAC2 | 007-4-single-phase | 340 | 203 | 77 | 345 | 54 | G1 | 267 | 160 | 175 | 189 | 249 | 49 | 9x14 |
| LAC2 | 007-2-single-phase | 340 | 203 | 77 | 345 | 54 | G1 | 267 | 160 | 175 | 189 | 249 | 49 | 9x14 |
| LAC2 | 007-4-three-phase | 365 | 203 | 64 | 395 | 42 | G1 | 510 | 160 | 213 | 225 | 429 | 50 | 9 |
| LAC2 | 007-2-three-phase | 365 | 203 | 64 | 395 | 42 | G1 | 510 | 160 | 213 | 225 | 434 | 50 | 9 |
| LAC2 | 011-4-three-phase | 440 | 203 | 62 | 470 | 41 | G1 | 510 | 230 | 250 | 249 | 453 | 50 | 9 |
| LAC2 | 011-2-three-phase | 440 | 203 | 62 | 470 | 41 | G1 | 510 | 230 | 250 | 249 | 475 | 50 | 9 |
| LAC2 | 016-6-three-phase | 496 | 203 | 66 | 526 | 46 | G1 | 510 | 230 | 278 | 272 | 474 | 50 | 9 |
| LAC2 | 016-4-three-phase | 496 | 203 | 66 | 526 | 46 | G1 | 510 | 230 | 278 | 272 | 479 | 50 | 9 |
| LAC2 | 016-2-three-phase | 496 | 203 | 66 | 526 | 46 | G1 | 510 | 230 | 278 | 272 | 496 | 50 | 9 |
| LAC2 | 023-6-three-phase | 580 | 356 | 63 | 610 | 44 | G1 | 510 | 305 | 320 | 287 | 489 | 50 | 9 |
| LAC2 | 023-4-three-phase | 580 | 356 | 63 | 610 | 44 | G1 | 510 | 305 | 320 | 287 | 511 | 50 | 9 |
| LAC | 033-6-three-phase | 692 | 356 | 53 | 722 | 42 | G1¼ | 510 | 406 | 376 | 318 | 534 | 50 | 9 |
| LAC | 033-4-three-phase | 692 | 356 | 53 | 722 | 42 | G1¼ | 510 | 406 | 376 | 318 | 618 | 50 | 9 |
| LAC | 044-6-three-phase | 692 | 356 | 53 | 866 | 59 | G1¼ | 510 | 584 | 448 | 343 | 559 | 50 | 9 |
| LAC | 044-4-three-phase | 692 | 356 | 53 | 866 | 59 | G1¼ | 510 | 584 | 448 | 343 | 643 | 50 | 9 |
| LAC | 056-8-three-phase | 868 | 356 | 49 | 898 | 43 | G1¼ | 510 | 584 | 448 | 343 | 643 | 50 | 9 |
| LAC | 056-6-three-phase | 868 | 508 | 49 | 898 | 43 | G1¼ | 510 | 584 | 464 | 368 | 668 | 50 | 9 |
| LAC | 056-4-three-phase | 868 | 508 | 49 | 898 | 43 | G1¼ | 510 | 584 | 464 | 368 | 668 | 50 | 9 |
| LAC | 058-8-three-phase | 868 | 508 | 49 | 898 | 43 | G2 | 510 | 584 | 464 | 388 | 652 | 30 | 9 |
| LAC | 058-6-three-phase | 868 | 508 | 49 | 898 | 43 | G2 | 510 | 584 | 464 | 388 | 682 | 30 | 9 |
| LAC | 058-4-three-phase | 868 | 508 | 49 | 898 | 43 | G2 | 510 | 584 | 464 | 388 | 688 | 30 | 9 |
| LAC | 076-8-three-phase | 1022 | 518 | 41 | 1052 | 45 | G1½ | 800 | 821 | 541 | 393 | 693 | 70 | 14 |
| LAC | 076-6-three-phase | 1022 | 518 | 41 | 1052 | 45 | G1½ | 800 | 821 | 541 | 393 | 710 | 70 | 14 |
| LAC | 078-8-three-phase | 1022 | 518 | 41 | 1052 | 45 | G2 | 800 | 821 | 541 | 413 | 713 | 50 | 14 |
| LAC | 078-6-three-phase | 1022 | 518 | 41 | 1052 | 45 | G2 | 800 | 821 | 541 | 413 | 730 | 50 | 14 |
| LAC | 110-8-three-phase | 1185 | 600 | 54 | 1215 | 45 | G2 | 800 | 985 | 623 | 418 | 785 | 70 | 14 |
| LAC | 110-6-three-phase | 1185 | 600 | 54 | 1215 | 45 | G2 | 800 | 985 | 623 | 418 | 785 | 70 | 14 |
| LAC | 112-8-three-phase | 1185 | 600 | 54 | 1215 | 45 | G2 | 800 | 985 | 623 | 438 | 805 | 50 | 14 |
| LAC | 112-6-three-phase | 1185 | 600 | 54 | 1215 | 45 | G2 | 800 | 985 | 623 | 438 | 805 | 50 | 14 |
| LAC | 113-8-three-phase | 1200 | 600 | 82 | 1215 | 45 | G2 | 860 | 985 | 623 | 465 | 833 | 82 | 14 |
| LAC | 113-6-three-phase | 1200 | 600 | 82 | 1215 | 45 | G2 | 860 | 985 | 623 | 465 | 871 | 82 | 14 |
| LAC | 200-8-three-phase | Please see LAC 200 brochure for more information | | | | | | | | | | | | |
| LAC | 200-6-three-phase | | | | | | | | | | | | | |

# Key for LAC/LAC2 Air Oil Coolers

## All positions must be filled in when ordering:

| EXAMPLE: | LAC2 - | 016 - | 6 - | A - | 50 - | T20 - | D - | 0 |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

**1. AIR OIL COOLER WITH AC MOTOR = LAC / LAC2**

### 2. COOLER SIZE

002, 003, 004, 007, 011, 016, 023, 033, 044, 056, 058, 076, 078, 110, 112, 113 and 200.

### 3. NUMBER OF POLES, MOTOR

| | |
|---|---|
| 2 - pole | = 2 |
| 4 - pole | = 4 |
| 6 - pole | = 6 |
| 8 - pole | = 8 |

### 4. VOLTAGE AND FREQUENCY (IE2 GUARANTEED AT 50HZ)

| | |
|---|---|
| No motor | = 0 |
| 230/400V 50Hz[1)] | = A |
| 460V alt 480V 60Hz[1)] | = B |
| Single-phase 230V 50Hz (not IE2) | = C |
| 230/400V 50Hz 460 alt 480V 60Hz[2)] | = D |
| 500V 50Hz (not standard) | = E |
| 400/690V 50Hz 460 alt 480V 60Hz | = F |
| 525V 50Hz, 575V 60Hz | = G |
| Motor for special voltage or frequency (stated in plain language)[3)] | = X |

1) for LAC 033 to LAC 113
2) For LAC2 007 to LAC2 023
3) For other options contact Parker for assistance. All motors apply to IEC 60034, IEC 60072 and EN 50347

### 5. THERMO CONTACT

| | |
|---|---|
| No thermo contact | = 00 |
| 40 °C | = 40 |
| 50 °C | = 50 |
| 60 °C | = 60 |
| 70 °C | = 70 |
| 80 °C | = 80 |
| 90 °C | = 90 |

### 6. COOLER MATRIX

| | |
|---|---|
| Standard | = 000 |
| Two-pass | = T00 |
| **Built-in, pressure-controlled bypass, single-pass** | |
| 2 bar | = S20 |
| 5 bar | = S50 |
| 8 bar | = S80 |
| **Built-in, pressure-controlled bypass, two-pass*** | |
| 2 bar | = T20 |
| 5 bar | = T50 |
| 8 bar | = T80 |
| **Built-in temperature and pressure-controlled bypass, single-pass** | |
| 50 °C, 2.2 bar | = S25 |
| 60 °C, 2.2 bar | = S26 |
| 70 °C, 2.2 bar | = S27 |
| 90 °C, 2.2 bar | = S29 |
| **Built-in temperature and pressure-controlled bypass, two-pass*** | |
| 50 °C, 2.2 bar | = T25 |
| 60 °C, 2.2 bar | = T26 |
| 70 °C, 2.2 bar | = T27 |
| 90 °C, 2.2 bar | = T29 |

* = not for LAC2 002 - LAC2 004

### 7. MATRIX GUARD

| | |
|---|---|
| No guard | = 0 |
| Stone guard | = S |
| Dust guard | = D |
| Dust and stone guard | = P |

### 8. STANDARD/SPECIAL

| | |
|---|---|
| Standard | = O |
| Special | = Z |

## TECHNICAL SPECIFICATION

### FLUID COMBINATIONS

| | |
|---|---|
| Mineral oil | HL/HLP in accordance with DIN 51524 |
| Oil/water emulsion | HFA, HFB in accordance with CETOP RP 77H |
| Water glycol | HFC in accordance with CETOP RP 77H |
| Phosphate ester | HFD-R in accordance with CETOP RP 77H |

### MATERIAL

| | |
|---|---|
| Cooler matrix | Aluminum |
| Fan blades/hub | Glass fibre reinforced polypropylene/ Aluminum |
| Fan housing | Steel |
| Fan guard | Steel |
| Other parts | Steel |
| Surface treatment | Electrostatically powder-coated |

### TECHNICAL DATA, COOLER MATRIX

| | |
|---|---|
| Maximum static operating pressure | 21 bar |
| Dynamic operating pressure | 14 bar* |
| Heat transfer limit | ± 6 % |
| Maximum oil inlet temperature | 120 °C |

* Tested in accordance with ISO/DIS 10771-1

### TECHNICAL DATA FOR 3-PHASE MOTOR

3-phase asynchronous motors in accordance with IEC 34-1 and IEC 72 in accordance with DIN 57530/VDE 0530

| | |
|---|---|
| Insulation class | F |
| Rise of temperature | B |
| Protection class | IP 55 |

### TECHNICAL DATA FOR 1-PHASE MOTOR

| | |
|---|---|
| Insulation class | B |
| Rise of temperature | B |
| Protection class | IP 44 |

### TECHNICAL DATA FOR 3-PHASE MOTOR LAC2 004

| | |
|---|---|
| Rated voltage | 230/400V 50/60Hz |
| Insulation class | B |
| Rise of temperature | B |
| Protection class | IP 44 |

### COOLING CAPACITY CURVE

The cooling capacity curves in this technical data sheet are based on tests in accordance with EN 1048 and have been produced using oil type ISO VG 46 at 60 °C.

### CONTACT PARKER HANNIFIN FOR ADVICE ON

| | |
|---|---|
| Oil temperatures | > 120 °C |
| Oil viscosity | > 100 cSt |
| Aggressive environments | |
| Ambient air rich in particles | |
| High-altitude locations | |