aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Air Oil Cooler
Water Oil Cooler
Pump and Accessories

OIL SOLUTIONS

1800-OILSOL
1800-645765

https://oilsolutions.com.au/

sales@oilsolutions.com.au

Parker

OLAER

Effective December 1st, 2016
HY10-8000/UK rev2-AP

ENGINEERING YOUR SUCCESS.

Table of Content

1 Introduction

1.1 About Parker Hannifin

With annual sales exceeding $12 billion, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace markets. The company employs over 50,000 people in 50 countries around the world. Parker has increased its annual dividends paid to shareholders for 53 consecutive years, among the top five longest-running dividend-increase records in the S&P 500 index. For more information, visit the company's web site at http://www.parker.com , or its investor information site at http://www.phstock.com .

1.2 About Parker Hannifin China

Parker Hannifin China was established in the 1980s. It was one of the first three joint ventures after China opened to the outside world and attracted foreign direct investment. Parker Hannifin owns over 2000 product lines in China with a wide range of products covering more than 50 markets. Parker Hannifin is com mitted to provide high product technologies to aerospace, climate control, electromechanical, filtration, flui d and gas handling, hydraulics, pneumatic, process control and seal & shielding. Products and solutions are widely used at diesel engine, wind turbine, shipbuilding industry, oceanic exploration, steel industry, heavy mobile equipment, high-speed railways and factory automation. With more than 14 factories in China,Parker Hannifin continues to expand its footprint. For more information, visit the company's website at http://www.parker.com , or its investor information site at http://www.phstock.com .

2 Industry leading Experience and Capability

2.1 History

Inventor of the Bladder Accumulator in 1936, dynamic and constant development has permitted the Olaer Group to position itself as one of the world's leaders in the provision of Fluid Management Solutions. From Conception to Commercialization, the Olaer Group was recognized as Professional Choice" offering solutions for Energy Storage and Cooling of FLuids.
In 2005, Olaer Group reinforced its Image by merging Olaer, Oiltech, Oilair, FCH brands in one OLAER Brand responding to market demand.
Present on 5 continents, the OLAER Group has been able to establish a partnership with the major operators worldwide with personalized and unrivaled levels of close support.
Global Leader in Power Motion Control, Parker Hannfin acquired Olaer Group in 2012 and formed 3 Accumulator and Cooler Divisions. ACDAP is the Accumulator and Cooler Division operating in Asia Pacific.

2.2 Product Range

With Design Centers and Manufacturing Facilities located in Asia pacific, ACDAP (Accumulator and Cooler Division Asia Pacific) provides Complete Accumulator and Cooler product ranges in compliance with International & Group Standards.

Accumulator
Product Range

EHV – Series
Bladder Accumulator EHV | EHVF

EBV – Series
Bladder Accumulator ELG | OLG | EBV

EHP – Series
Industrial Piston Accumulator EHP

Battery
Modular Design Side By Side | Linear

APD – Series

ELM – Series
Diaphragm Accumulator ELM

ACP – Series
Piston Accumulator ACP

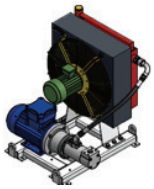
EBV – Series
Bladder Accumulator EBV

Cooler
Product Range

L - Series
Oil/Air coolers AC | DC | HC | OC

QPM
Gerotor pump

CCS
Combination cooling



Modules

PWO
Water Oil

OHP
Screw pump

GWO
Gasketed Heat Exchanger

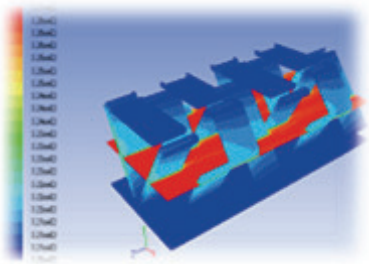
PST
Shell & Tube

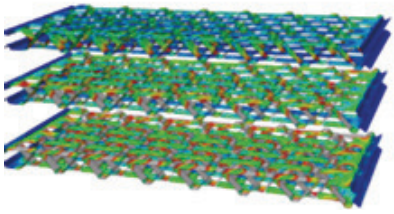
2.3 Design Process

PARKER China engineering team is develops, tests and validates products, through the use of advanced programs and engineering process, such as :

- Parker heat exchange calculation software in order to allow radiator sizing and performance prediction
- FEA software for mechanical stress calculation to ensure product
  reliability and durability
- 2D/3D Design with digital exchange available (IGES, STEP formats)allowing customer to check the product implementation in the final machine
- Prototyping following advanced quality planning process, in order to guarantee the product compliancewith design data
- Testing to confirm product compliance with technical requirements
- On site validation, as machine design and environnement is critical
  for the heat exchanger to perform as per calculationThese engineering and quality tools used along product development process allow PARKER to ensure product design and performa nce
  are matching customer expectations and technical requirement, thus allowing a smooth transfer to pre-serial and mass production.

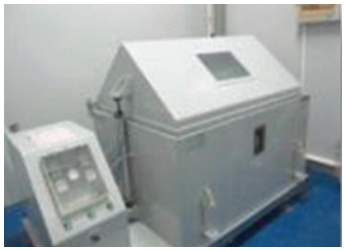
Ansys CFD:Computational Fluid Dynamics





Abaqus FEA:Finite Element Analysis

2.4 Laboratory test and Capability



In order to evaluate real product performances, PARKER has a laboratory equipped with performance test machines. In house testing is available for :
Complete fan cooler performance test, where the fluid to be cooled can be mineral Oil (i.e Hydraulics, Gearboxes) or Water glycol (i.e Engine Cooling, Windmill coolers). Cooling performances, Pressure drop, Airflow, Noise and power consumption can be measured and verified during this process.
Water/Oil cooler performance tests, for coolers where the Hot fluid (Oil, Water glycol) is cooled trough the use of pure water.
Pressure testing, guarantying the pressure equipment proofness, as a quality control.
Wind tunnel tests for radiator development and fins performance improvements.
Onsite validation testing, as machine design and environment can impact greatly performance, PARKER can assist customer in the machine validation process to validate relevant parameters that will guarantee machine optimal performance.
Corrosion tests allowing PARKER to validate product and treatments resistance against aggressive environments such as offshore applications.

2.5 Production Process and quality assurance

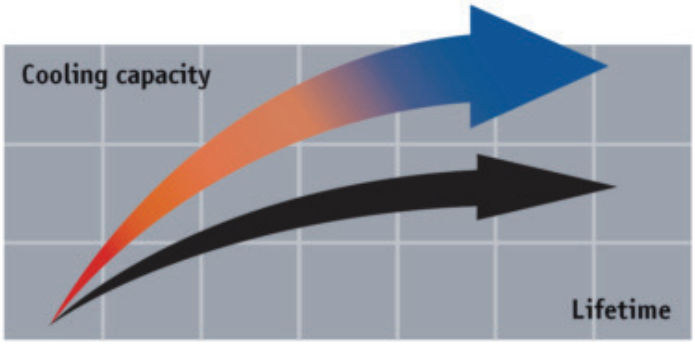
Corrosion tests allowing PARKER to validate product and treatment resistance against aggressive environments such as offshore.

Other test can be performed by PARKER using approved 3rd parties laboratories in order to fulfill customer requirements such as (but not limited to) mechanical stress, 3 axis vibration testing, pressure fatigue tests. Any request is studied by PARKER engineering to fulfill best option to guarantee product lifetime in customer application.

3. How to select Cooler

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.

3.1 Why Cooling



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

(Ploss = Pcool = Pin - Pused).

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.

More Cooling Per $

with precise calculations and our engineers' support

Optimal sizing produces efficient cooling.

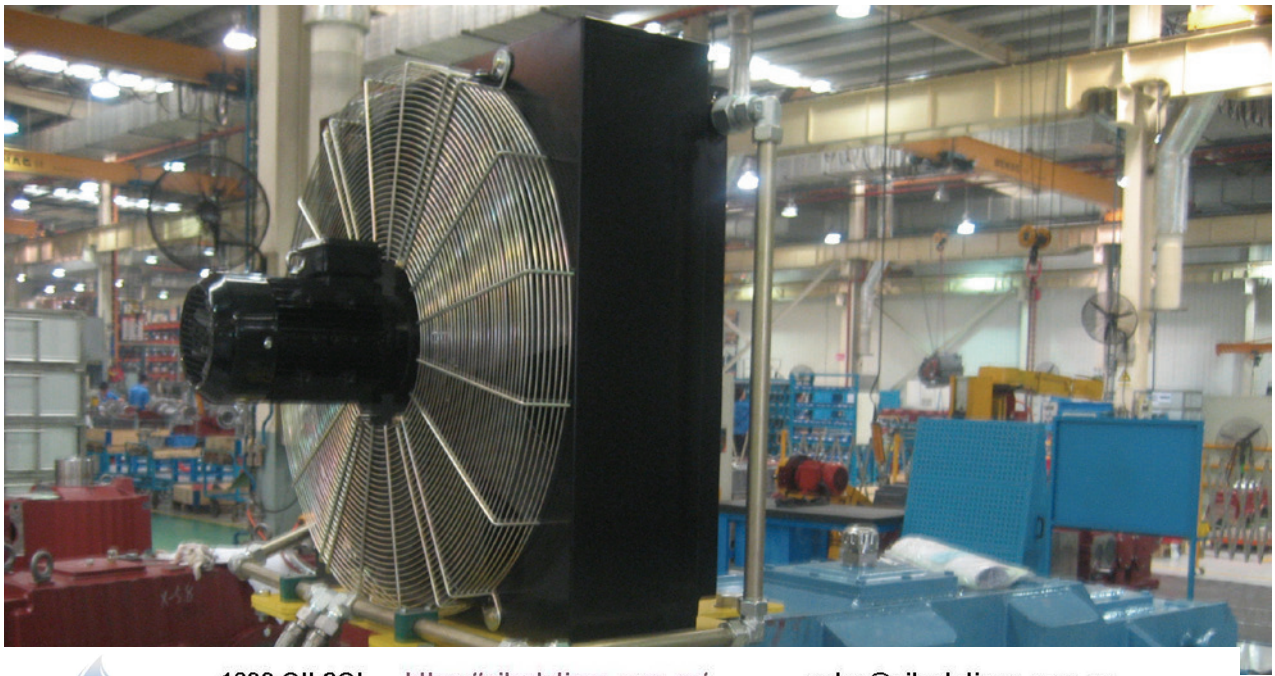
Correct sizing requires knowledge and experience. Our calculation program, combined with our engineers' support, gives you access to this very knowledge and experience. The result is more cooling per $ invested.

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.



3.2 Sizing a cooler

3.2.1 Understanding the head load of your system

Mechanical and hydraulic systems are used to generate and transmit power. Mechanical efficiencies, Friction coefficients, hydraulic pressure loss, and other sources of power losses will generate heat.

A cooler is hydraulic device that will cope with system heat loads and allow keeping a constant fluid temperature in your system in order to decrease your machine size, improve your system efficiency,components lifetime and reduce operating costs.

Heating power of a system can be defined as a system fluid temperature increase from a temperature T1 to a temperature T2 over a certain period of time t, for a given fluid and total fluid volume (If this is determinate by test, test has to be performed without cooler installed).

$$P_{Heat} = (T_2 - T_1) \times \frac{V}{T} \times S_g \times S_h$$

P_{Heat}: System heating power (kW)

V: Total System volume (l)

S_g: fluid Specific gravity (kg/l)

S_h: Fluid specific heat (kJ/kg°C)

T_2: Final fluid temperature (°C)

T_1: Starting fluid temperature (°C)

T: Time to increase from T1 to T2 (s)

In order to keep a constant temperature in the system, the selected cooler cooling power needs to equal the system heating power at given flow rate and maximum ambient temperature.

Cooling power of a cooler is defined as a function of the inlet and outlet fluid temperatures, ambient temperature, flow rate and fluid properties :

$$P_{Cool} = (T_{in} - T_{out}) \times \frac{Q}{60} \times S_g \times S_h$$

P_{Cool}: Cooler cooling power (kW)

Q: Hot fluid flow rate through the cooler (l/min)

S_g: fluid Specific gravity (kg/l)

S_h: Fluid specific heat (kJ/kg°C)

T_{in}: Hot Fluid inlet temperature before cooler (°C)

T_{out}: Hot fluid outlet temperature after cooler (°C)

T: Time to increase from T1 to T2 (s)

AIR/LIQUID COOLER SIZING

When the heating power has been identified, please refer to the specific products catalogue, whether power supply is AC, DC or Hydraulics.

Calculate the ETD of your system by following formula:

$$\mathbf{ETD = T_{inmax} - T_{ambmax}}$$

T_{inmax}: Maximum hot fluid temperature allowed in the system (°C)

T_{ambmax}: Maximum ambient temperature (°C)

In a hydraulic system where the max hot fluid temperature allowed is 60°C, and the maximum ambient temperature is 40°C, ETD = 20°C.

Divide the cooling power, P_{Cool}, needed by the ETD in order to find the cooling capacity needed for the application under given conditions :

$$\mathbf{C.\ P_{Cool} / ETD}$$

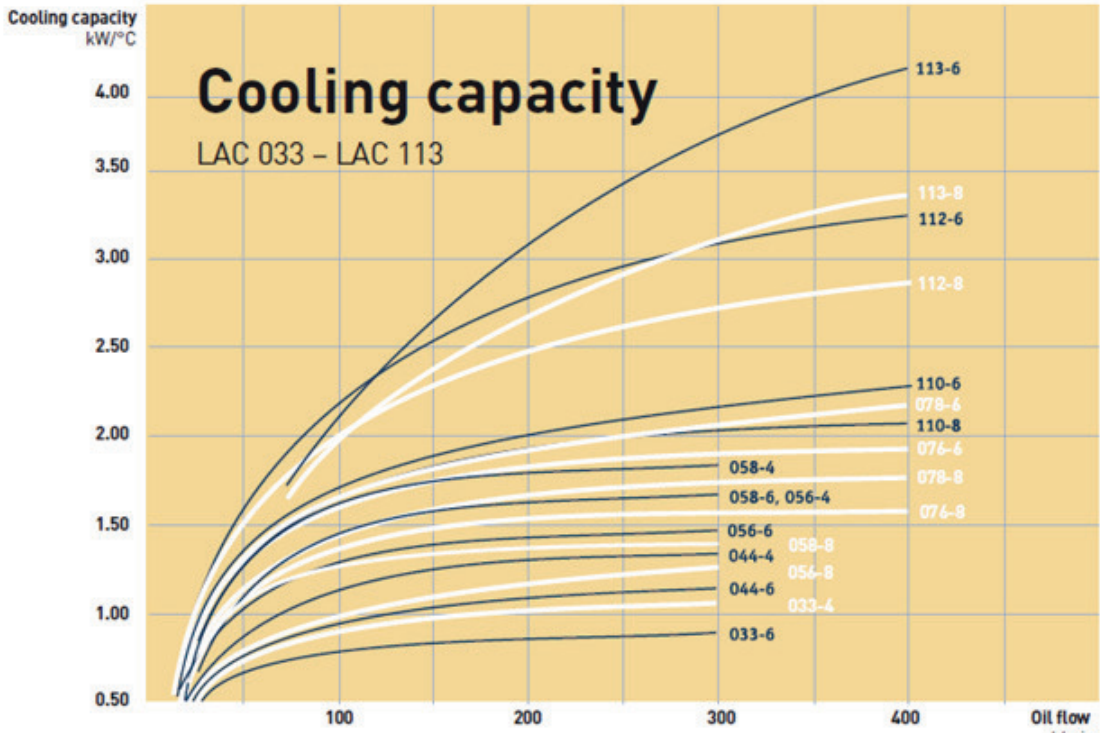
C.C: Cooling capacity needed (kW/°C)

Plot the Cooling capacity on the catalogue at desired flow rate to identify the suitable cooler. Coolers with a curve above this point will be suitable for this application.

See below example for a cooling capacity of 2,00 kW/°C at 200L/min. The matching cooler for this application with AC driven motor is a LAC-110-6

Additionally, cooler sizing software can be downloaded from Parker website for Heating power calculation, cooler selection, cooler parameters and drawings.

For any specific case, please contact your local Parker office to provide extended calculations and performance reports.



4. Installation & Service Instructions

4.1 COOLER TRACEABILITY

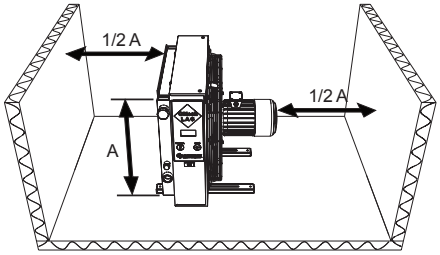
The new range of cooler is using Olaer's new identification system in order to increase the traceability and improve after sale service.

Designation
LHC2 007-A-00-000-0-0
P/N: 5838007001
W/O: 030797

If you have any questions about your cooler, please provide part number and works order number.

4.2 COOLER INSTALLATION

- Install your cooler so that there is an unrestricted airflow around the cooler
- The distance from the nearest wall should not be less than half of the height of the cooler



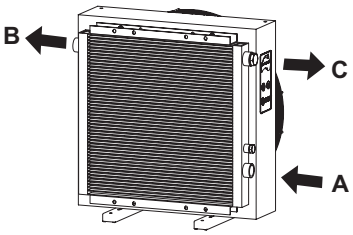
Inappropriate location of the air cooler could generate increased

- The very rigid construction of the cooler permits both face and foot Mounting

For the larger range of coolers, lifting can be done thanks to the Lifting eye bolt (Available at your Olaer distributor) in order not to damage the unit

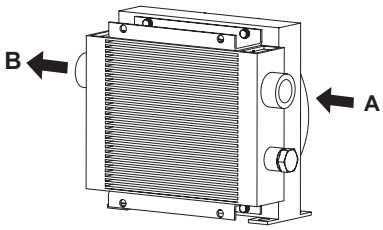
- Low electric magnetic emmissions

4.3 MATRIX CONNECTION



	SINGLE PASS	DOUBLE PASS
INLET	A	A
OUTLET	B	C

The Matrix can be flipped in order to swap inlet and outletside. If required, please specify when ordering.



4.4 E-MOTOR WIRING AND START UP INSTRUCTION

Prior to start up, check:

- Matrix and Fan guard is free from damage (during transport)
- Fan rotates freely (By hand)
- That all hydraulic connections are tight
- That the inside fan housing is free from external objects.

Danger
Risk of Electrical shock. Electrical connections should be made by a qualified electrician!

Once the motor is connected, turn on and off to spin the fan. Then check fan rotation and air flow are as indicated on the sticker on the side of the case.

4.5 BEFORE INITIAL START UP OF THE COOLER

- Check the cooler is securely fixed and correctly connected
- Run the Air-Oil cooler with the system fluid
- Filter the fluid after passing through the cooler

4.6 PREVENTIVE MAINTENANCE

Preventive Maintenance must be carried out at regular intervals.

Make sure:

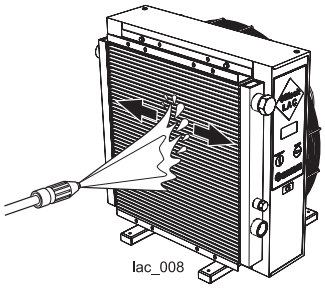
- There is no abnormal noise or vibrations, and that the cooler is securely fixed
- The cooler matrix is clean - Debris will reduce the cooling capacity by obstructing the air flow
- The warning label is in good condition, replace damaged or missing immediately

4.7 CLEANING YOUR AIR-OIL COOLER

AIR-OIL COOOLER

- When cleaning exterior of the cooler for instance using water, disconnect all power supplies
- Be aware that standard motor are only protected against low pressure jet of water (IP55)

COOLER MATRIX



The air fins of the matrix can be cleaned with compressed air.
If necessary a high pressure washing system and degreasing agent can be used (Check compatibility with oil).
When using a high-pressure washing system point the jet parallel to the air fins.

FAN HOUSING

Remove the cooler matrix when cleaning the inside of the fan housing.

To clean the inside of the fan housing use compressed air from the electric motor side through the fan guard.

4. 8 TECHNICAL SPECIFICATION

Cooler Matrix	
Maximum Static Working Pressure	21 Bar
Maximum Dynamic Working Pressure	14 Bar
Maximum Fluid inlet Temperature	120 Bar
Fluid Compatibility	
Mineral Oil	HL/HLP according to DIN 51524
Oil/Water emulsion	HFA, HFB according to CETOP RP 77H
Water glycol	HFC according to CETOP RP 77H
Phosphate Ester	HFD-R according to CETOP RP 77H
Material	
Cooler Matrix	Aluminium
Fan Housing	Steel
Fan Blades/Hub	Glass fibre reinforced polypropylene/Aluminium
Fan Guard	Steel

5 Explosive Environment

Parker LAC-X and LHC-X coolers are intended for cooling of hydraulic fluids in industrial systems in areas where potentially explosive atmospheres may occur, above ground such as, but not limited to : open air mining, drilling equipment, offshore plateform.

The LAC-X is defined and approved as a non-electrical device by a European notification body.

The electric motor used in the LAC-X is evaluated by the motor supplier and complies with current directives. All non-electrical parts of the oil cooler, i.e. all parts except from the electric motor, comply with the essential health and safety requirements and the supplementary requirements for equipment in Category 2, Equipment Group II, Annex II of the Directive ATEX 94/9/EC. The non-electrical parts of the LAC-X are safe for use in potentially explosive atmospheres caused by gases, vapours or mists classified as Zone 1 and 2 and also in potentially explosive atmospheres caused by air/dust mixtures classified as Zone 21 and 22.

The LAC-X is fitted with an electric motor supplied by Parker or by the customer. A cooler supplied by Parker is approved for explosive atmospheres according to the customer's request.

6 Marine Environment

The American Bureau of Shipping (ABS) is a classification society, with a mission to promote the security of life, property and the natural environment, primarily through the development and verification of standards for the design, construction and operational maintenance of marine-related facilities

Parker has a range of marine ABS design assessed Air/Liquid coolers developed specifically for marine application where product compliance with applicable section of the ABS rules is a must.

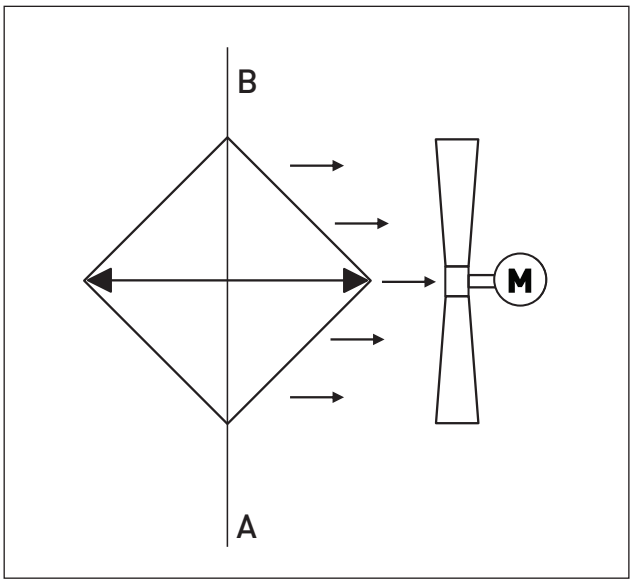
Additionally to ABS design assessed cooler, Parker also can provide Air/Liquid coolers with ABS type approval, when customer needs each product to be individually inspected and certified, as it can be the case for drilling units.

Please contact your local Parker office for specific cases related to ABS products.

Note:

AC Driven Fan Cooler

IN THIS SECTION



Features

- Cooling capacity up to 300 kW
- Compact and light weight
- Quiet fan and fan motor
- Single-phase or three-phase AC motor
- Low pressure drop
- High cooling capacity
- Service-friendly and easy to retrofit
- LAC- M for marine environments
- LAC-X for ATEX requirements

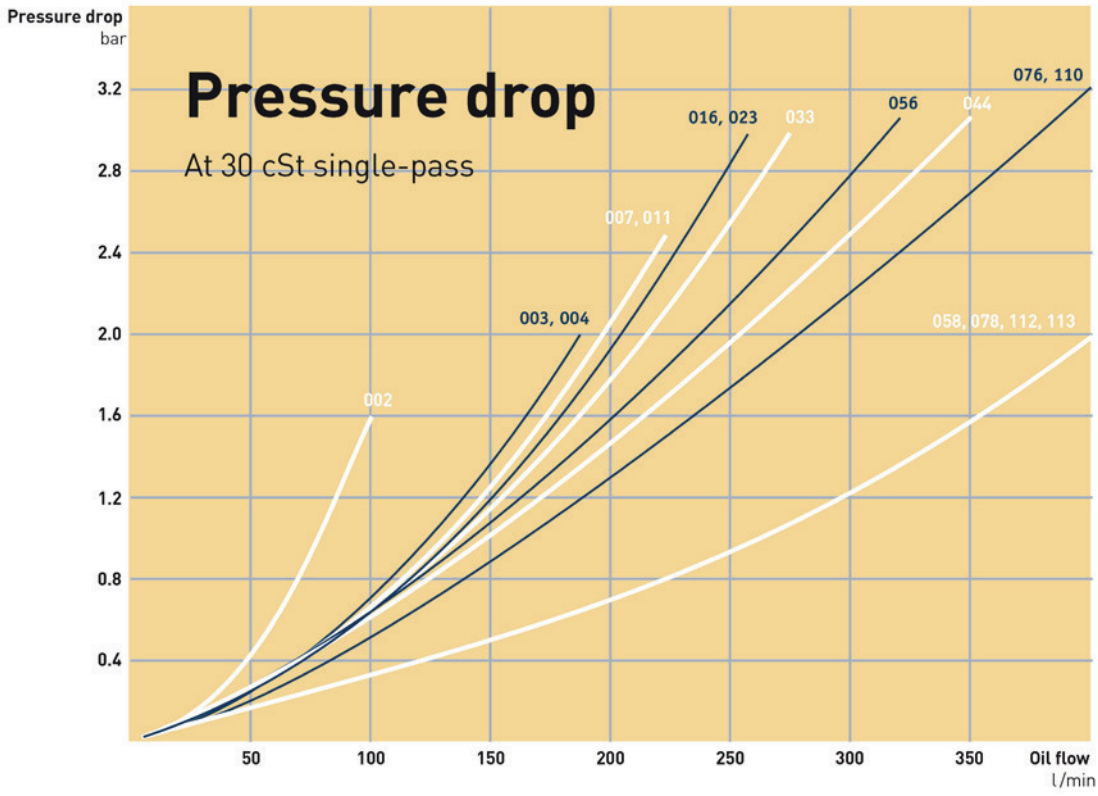
Models, capacities, Noise and Weight

Type	LpA dB (A) 1m*	kW	kg (approx)
LAC 002-2-single-phase	50	2-0.05	4
LAC 003-2-single-phase	61	2-0.05	5
LAC 004-2-single-phase	63	2-0.07	6
LAC 002-2-three-phase	63	2-0.07	6
LAC 007-4-single-phase	65	2-0.08	9
LAC 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

Type	LpA dB (A) 1m*	kW	kg (approx)
LAC 056-8-three-phase	73	8-0.55	73
LAC 056-6-three-phase	81	6-1.50	75
LAC 056-4-three-phase	84	4-2.20	75
LAC 058-8-three-phase	74	8-0.55	80
LAC 058-6-three-phase	82	6-1.50	82
LAC 058-4-three-phase	85	4-2.20	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 ±3dB(A)
LpA dB (A) 1m* = Acoustic pressure Level
kW = N° of poles-Capacity
kg(approx) = weight

Presure Drop



LAC cooler for Industrial Application

Why use LAC cooler:

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.

Return Line cooler on Hydraulic Power Unit.

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	Glass fibre reinforced polypropylene
Fan Hub	Aluminum
Fan housing	Steel
Fan guard	Steel
Other parts	Steel
Surface treatment	Electrostatically powder-coated

COOLING CAPACITY CURVES
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 OLAER FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

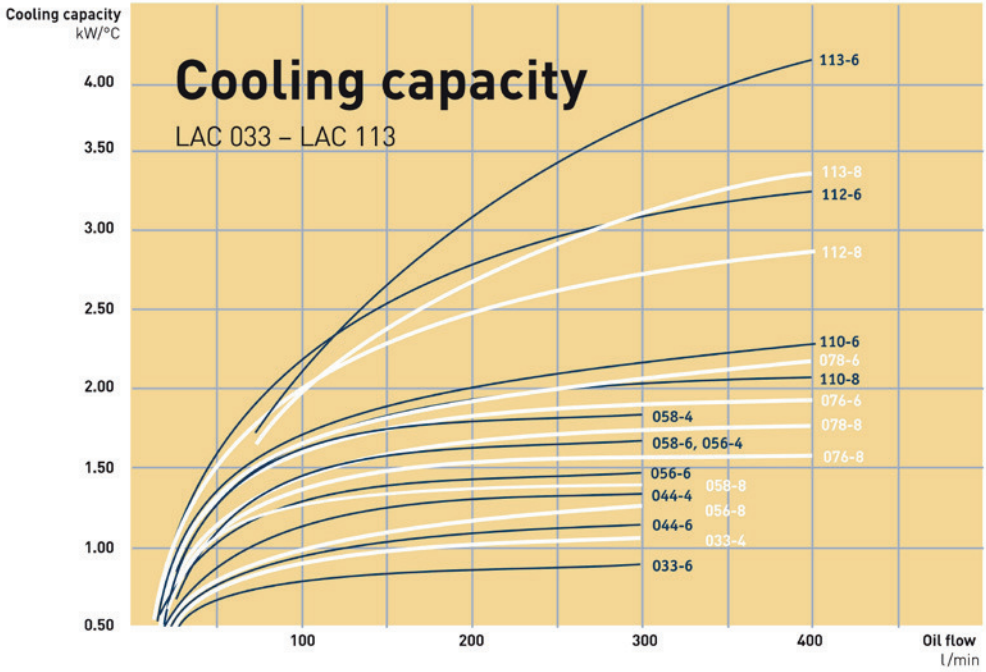
TECHNICAL DATA, COOLER MATRIX	
Maximum static operating pressure	21 bar
Dynamic operating pressure	14 bar*
Heat transfer limit	±6%
Maximum oil inlet temperature	120 °C
* Tested in accordance with ISO/DIS 10771-1	

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	IP55

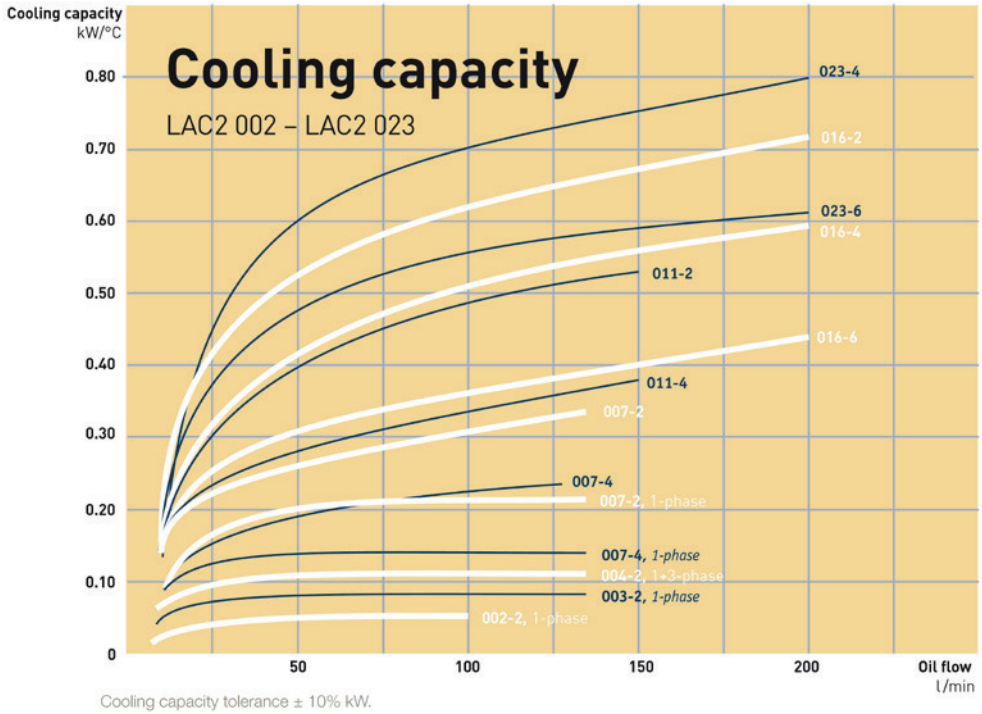
TECHNICAL DATA FOR 1-PHASE MOTOR	
Insulation class	B
Rise of temperature	B
Protection class	IP 44

TECHNICAL DATA FOR 3-PHASE MOTOR LAC 004	
Rated voltage	230/400V 50/60 Hz
Insulation class	B
Rise of temperature	B
Protection class	IP 44

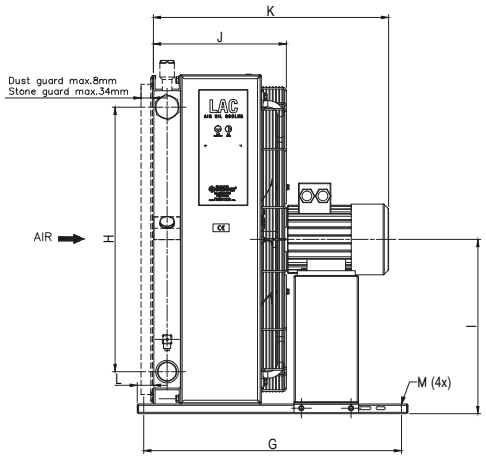
Performance-cooling capacity

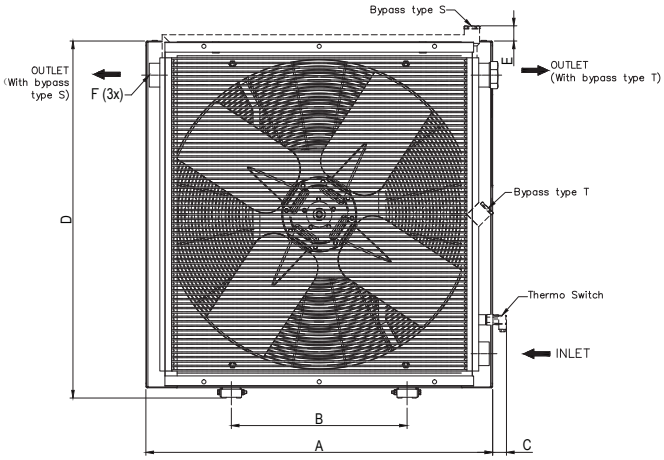


The cooling capacity curves are based on the inlet oil temperature and the ambient air temperature. An oil temperature of 60 °C and an air temperature of 20 °C produce a temperature difference of 40 °C. Multiply by kW/ °C for total cooling performance in kW.



Cooling capacity tolerance ± 10% kW.





Dimensions

TYPE	A	B	C	D	E	F	G	H	I	J	K	L	MØ
LAC 002-2-single-phase	155	74	68	186	-	G½	186	72	99	92	153	37	9
LAC 003-2-single-phase	210	134	68	223	73	G1	145	90	118	112	225	27	9
LAC 004-2-single-phase	250	134	68	259	66	G1	145	90	131	117	230	27	9
LAC 002-2-three-phase	250	134	68	259	66	G1	145	90	131	117	230	27	9
LAC 007-4-single-phase	340	203	64	343	52	G1	267	160	213	135	252	56	9
LAC 007-2-single-phase	340	203	64	343	52	G1	267	160	213	135	252	56	9
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	1510	1420	77	1630	56	G2	900	1285	830	476	962	37	18
LAC 200-6-three-phase	1510	1420	77	1630	56	G2	900	1285	830	476	1006	37	18

How to Order LAC Cooler

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
LAC2 only valid for size 007 to 023 equipped with 3 phase motor

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, FREQUENCY AND EFFICIENCY	
Worldwide	
No motor [4]	= 0
230/400V 50Hz - IE2 [1]	= A
460V 60Hz - IE2 [1]	= B
Single Phase 230V 50Hz (No IE)	= C
230/400V 50Hz & 460V 60Hz - IE2 [2]	= D
500V 50Hz - IE2	= E
400/690V 50Hz - IE2	= F
525V 50Hz & 575V 60Hz - IE2	= G
Motor for special voltage or frequency [5]	= X
1) For LAC-033 to 113	
2) For LAC2-007 to LAC2-023	
3) For other option contact PARKER for assistance	
4) Required Frequency to be mentioned at the end of description	
5) Stated in plan language at end of description	

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 LAC-002 - LAC-004	

7. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

8. STANDARD/SPECIAL	
Standard	= 0
Special [1]	= Z
1) Stated in plan language at end of description	

LAC-M cooler for Marine Application

Why use LAC-M COOLER

LAC-M air oil cooler with AC-motor is designed to resist aggressive environments such as marine, offshore and coastal environments, environments with a high level of contamination such as chemical industries, refineries etc. Maximum cooling capacity is 300 kW at ETD 40 °C. All components are selected for optimal performance and corrosion resistance.

LAC-M on Marine Crane

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	Glass fibre reinforced polypropylene (PPG)
Fan Hub	Aluminum
Motor Hub	Aluminum
Electrical Motor	Aluminum or Cast iron
Fan housing	Steel
Fan guard	Steel
Dust Guard	Stainless Steel
Other parts	Steel
Thermo-contact	Brass

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	

SURFACE TREATMENT	
Cooler Matrix	Black Powder Coated
Fan Blades	Black Powder Coated
Motor Hub (Size 033 and up)	Black Anodized
Electric Motor	Painted Black
Other parts	Pre-heated and black Powder Coated

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 56
The heater should be connected to 220V 50/60 Hz. The output of the heater depends on motor size. Use a relay to allow the heater to start when the motor stops. Alternatively, the heater can be constantly connected.	

THERMO CONTACT	
Protection Class	IP 67
Maximum Oil temperature	120 °C

COOLING CAPACITY CURVES
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 OLAER FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

How to Order LAC-M Cooler

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

1. MARINE AIR OIL COOLER WITH AC MOTOR = LAC-M/LAC2-M
LAC2-M only valid for size 007 to 023 equipped with 3 phase motor

2. COOLER SIZE
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, FREQUENCY AND EFFICIENCY	
Worldwide	
No motor [4]	= 0
230/400V 50Hz - IE2 [1]	= A
460V 60Hz - IE2 [1]	= B
Single Phase 230V 50Hz (No IE)	= C
230/400V 50Hz & 460V 60Hz - IE2 [2]	= D
500V 50Hz - IE2	= E
400/690V 50Hz - IE2	= F
525V 50Hz & 575V 60Hz - IE2	= G
Motor for special voltage or frequency [5]	= X
1) For LAC-033 to 113	
2) For LAC2-007 to LAC2-023	
3) For other option contact PARKER for assistance	
4) Required Frequency to be mentioned at the end of description	
5) Stated in plan language at end of description	

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 LAC-002 - LAC-004	

7. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

8. STANDARD/SPECIAL	
Standard	= 0
ABS PDA approval	= A
Special [1]	= Z
1) Stated in plan language at end of description	

LAC-X cooler for Surface Explosive environment

Why use LAC-X COOLER

LAC-X air oil cooler is intended for cooling of hydraulic fluids in industrial systems in areas where potentially explosive atmospheres may occur, above ground.

The LAC-X is defined and approved as a non-electrical device. The electric motor used in the LAC-X is evaluated by the motor supplier and complies with current directives. All non-electrical parts of the oil cooler, i.e. all parts except from the electric motor, comply with the essential health and safety requirements and the supplementary requirements for equipment in Category 2, Equipment Group II, Annex II of the Directive ATEX 94/9/EC. The non-electrical parts of the LAC-X are safe for use in potentially explosive atmospheres caused by gases, vapours or mists classified as Zone 1 (and 2) and also in potentially explosive atmospheres caused by air/dust mixtures classified as Zone 21 (and 22). The LAC-X is fitted with an electric motor supplied by PARKER or by the customer. A cooler supplied by PARKER is approved for explosive atmospheres according to the customer's request.

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	Anti static glass reinforced polyamide - PAGAS
Fan Hub	Aluminum
Motor Hub	Aluminum
Electrical Motor	Aluminum or Cast iron
Fan housing	Steel
Fan guard	Steel
Dust Guard	Stainless 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	

COOLING CAPACITY CURVES
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 OLAER FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

How to Order LAC-X Cooler

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

1. ATEX AIR OIL COOLER WITH AC MOTOR = LAC-X/LAC2-X	
LAC2-X only valid for size 007 to 023 equipped with 3 phase motor	

2. COOLER SIZE	
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, FREQUENCY AND EFFICIENCY	
Worldwide	
No motor [4]	= 0
230/400V 50Hz - IE2 [1]	= A
460V 60Hz - IE2 [1]	= B
Single Phase 230V 50Hz (No IE)	= C
230/400V 50Hz & 460V 60Hz - IE2 [2]	= D
500V 50Hz - IE2	= E
400/690V 50Hz - IE2	= F
525V 50Hz & 575V 60Hz - IE2	= G
Motor for special voltage or frequency [5]	= X
1) For LAC-033 to 113	
2) For LAC2-007 to LAC2-023	
3) For other option contact PARKER for assistance	
4) Required Frequency to be mentioned at the end of description	
5) Stated in plan language at end of description	

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 LAC-002 - LAC-004	

7. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

8. STANDARD/SPECIAL	
Standard - GAS Environment	= 0
Standard - DUST Environment	= D
Standard - GAS&DUST Environment	= E
Special [1]	= Z
1) Stated in plan language at end of description	

ATEX COOLER ORDERING FORM

This form should be fully completed and signed and submitted to technical departement with sales order for approval

Customer:		Application type :	
Parker Sales:		Parker S/O Nb:	

This document needs to be fully filled by Customer
PARKER will not be liable for any uncomplete or incorrect statement about application information

	LAC	LHC
Cooler Type	AC motor ATEX	Hydraulic motor ATEX

	Temperature
Thermoswitch	50°C 60°C 70°C 80°C No

GROUP as per CE 94/9/CE AND ZONE								
	GAS (G)				DUST (D)			
Explosion Group	*I* ☐		II ☐		*I* ☐		II ☐	
Zone		*0* ☐	1 ☐	2 ☐		*20* ☐	21 ☐	22 ☐

Zone 1 Covers Zone 2 - Zone 21 Covers Zone 22

EQUIPMENT CATEGORY		
	GAS (G)	DUST (D)
Explosion Proof Motor	☐ IIA ☐ IIB ☐ IIC	☐ IIIA ☐ IIIB ☐ IIIC
Explosion Proof Motor	☐ EEx-de	☐ Other : _____
Motor Temperature Class	☐ T4 (135°C)	☐ Other : _____
Protection Class	☐ IP55	☐ Other : _____
Motor Origin	☐ Chinese made motor allowed ☐ European motor only	☐ Other : _____

Voltage (V)	
Frequency (Hz)	

Any Special requirement should be clearly identified below :

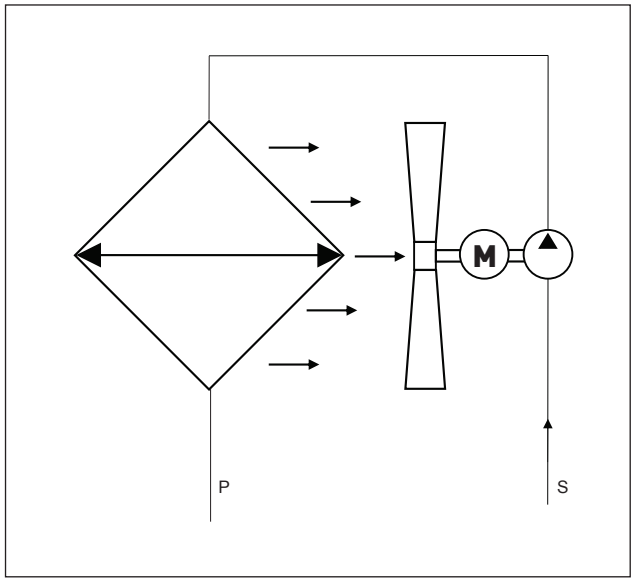
All information above to be provided to Parker for cooler selection
PARKER will submit Cooler code and Motor Datasheet for final approval by customer and confirmation by signature
Signature of this datasheet will state that both parties understand and agrees technical informations for production

Customer Signature :	PARKER Sales Signature :	Parker Technical Signature :
Date :	Date :	Date :

Note:

Offline Cooling System

IN THIS SECTION



Features

- Clever design and the right choice of materials and components produce a long useful life, high availability and low service and maintenance costs.
- Integrated ciculation pump produces and even flow with low pressure pulsations.
- Easy to maintain and easy to retrofit in many applications.
- Cooler matrix with low pressure drop and high cooling capacity.
- Quiet fan and fan motor.
- Compact design and low weight.

Why use LOC COOLER

The LOC 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. The cooling system can also be equiped with Parker filter unit. Together with a wide range of accessories, the LOC cooling system is suitable for installation in most applications and environments. The maximum cooling capacity is 45 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.

Specification

- LOC is designed primarily for synthetic oils, vegetable oils and mineral oil type HL/HLP in accordance with DIN 51524. Maximum oil temperature 100 °C.
- Maximum negative pressure in the inlet line is 0.4 bar with an oil-filled pump. Maximum pressure on the pump's suction side is 0.5 bar.
- Maximum working pressure for the pump is 10 bar. For information about suction height, pressure, etc. see the QPM3 pump manual.

3-phase motor	
3-phase asynchronous motors in accordance with IEC 60034-1	
Nominal voltage	*
Insulation class	F
Rise of temperature	B
Protection class	IP 55
Recommended ambient temperature	-20 °C – +40 °C
* See seprate instructions for electric motor	

Material	
Pump housing	Aluminum
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

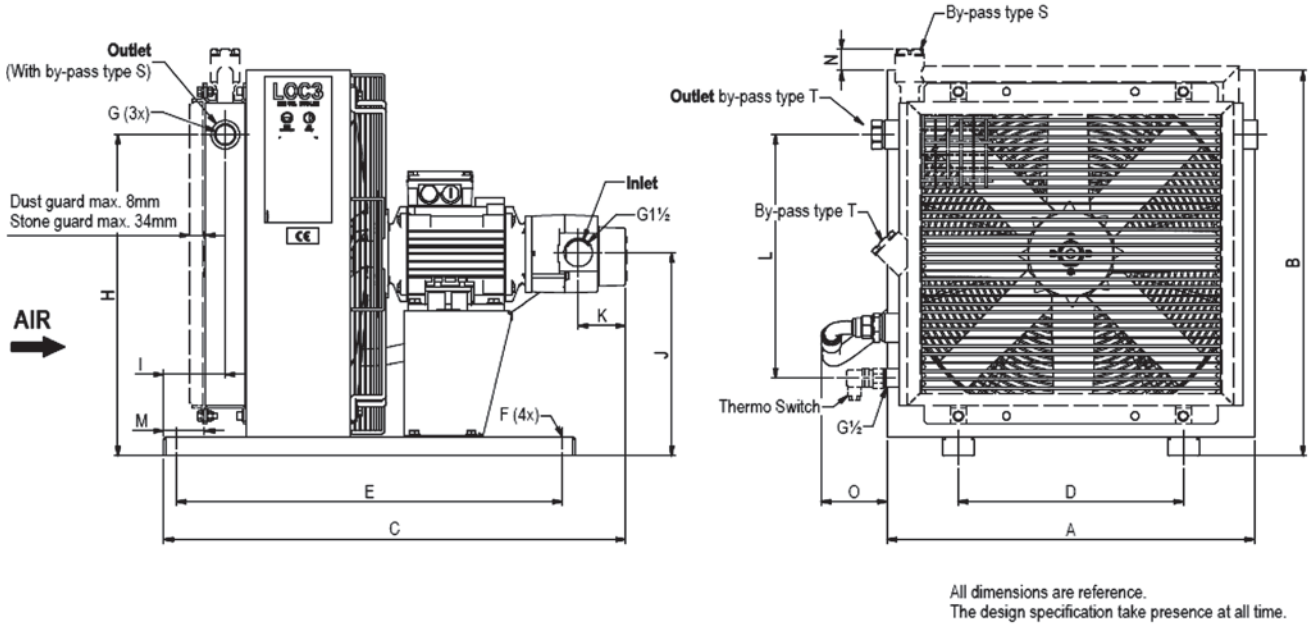
CONTACT PARKER HANNIFIN FOR ADVICE ON
Oil temperatures > 100 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

Models, capacities, Noise and Weight

TYPE	Nom. oil fow l/min	Cooling capacity in kW at EDT40 °C	Cooling capacity kW/°C	Acoustic pressure level LpA dB(A) 1m*	No. of poles/ Capacity kW	Weight kg (approx)
LOC3 004 - 4 - D - A	20	2.7	0.07	57	4-0.75	23
LOC3 007 - 4 - D - A	20	5.6	0.14	64	4-0.75	30
LOC3 007 - 4 - D - B	40	7.2	0.18	64	4-.075	30
LOC3 007 - 4 - D - C	60	8.0	0.20	65	4-1.50	36
LOC3 007 - 4 - D - D	80	8.4	0.21	65	4-1.50	36
LOC3 011 - 4 - D - A	20	9.2	0.23	70	4-0.75	34
LOC3 011 - 4 - D - B	40	10.4	0.26	70	4-0.75	34
LOC3 011 - 6 - D - C	40	7.6	0.19	61	6-1.10	40
LOC3 011 - 6 - D - D	55	8.8	0.22	61	6-1.10	40
LOC3 011 - 4 - D - C	60	12.0	0.30	70	4-1.50	40
LOC3 011 - 4 - D - D	80	13.2	0.33	70	4-1.50	40
LOC3 016 - 4 - D - A	20	11.2	0.28	74	4-1.50	45
LOC3 016 - 4 - D - B	40	15.6	0.39	74	4-1.50	45
LOC3 016 - 6 - D - C	40	12.4	0.31	64	6-1.10	45
LOC3 016 - 6 - D - D	55	14.0	0.35	64	6-1.10	45
LOC3 016 - 4 - D - C	60	18.0	0.45	74	4-1.50	45
LOC3 016 - 4 - D - D	80	19.6	0.49	74	4-1.50	45
LOC3 023 - 4 - D - B	40	21.2	0.53	77	4-1.50	53
LOC3 023 - 6 - D - C	40	16.8	0.42	67	6-1.10	53
LOC3 023 - 6 - D - D	55	18.4	0.46	67	6-1.50	53
LOC3 023 - 4 - D - C	60	24.4	0.61	77	4-2.20	62
LOC3 023 - 4 - D - D	80	26.8	0.67	77	4-2.20	62
LOC3 033 - 6 - A - D	55	26.0	0.65	74	6-2.20	92
LOC3 033 - 4 - A - C	60	32.0	0.80	85	4-3.00	76
LOC3 033 - 4 - A - D	80	34.8	0.87	85	4-3.00	76
LOC3 044 - 6 - A - D	55	34.0	0.85	77	6-2.20	98
LOC3 044 - 4 - A - C	60	40.0	1.00	86	4-3.00	85
LOC3 044 - 4 - A - D	80	44.8	1.12	86	4-3.00	85

* = Electric motors specified are calculated for max. working pressure 6 bar at 125 cSt and 50 Hz, 4 bar 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).

Dimensions



All dimensions are reference.
The design specification take presence at all time.

TYPE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
LOC3 004-4-D-A	267	284	542	134	420	Ø9	G1	206	88	159	62	90	55	67	123
LOC3 007-4-D-A	365	395	602	203	510	Ø9	G1	292	83	214	62	80	50	45	105
LOC3 007-4-D-B	365	395	615	203	510	Ø9	G1	292	83	214	74	80	50	45	105
LOC3 007-4-D-C	365	395	667	203	510	Ø9	G1	292	83	214	87	80	50	45	105
LOC3 007-4-D-D	365	395	680	203	510	Ø9	G1	292	83	214	100	80	50	45	105
LOC3 011-4-D-A	440	470	626	203	510	Ø9	G1	366	83	252	62	175	50	41	103
LOC3 011-4-D-B	440	470	639	203	510	Ø9	G1	366	83	252	74	175	50	41	103
LOC3 011-4-D-C	440	470	691	203	510	Ø9	G1	366	83	252	87	175	50	41	103
LOC3 011-4-D-D	440	470	704	203	510	Ø9	G1	366	83	252	100	175	50	41	103
LOC3 011-6-D-C	440	470	717	203	510	Ø9	G1	366	83	252	87	175	50	41	103
LOC3 011-6-D-D	440	470	730	203	510	Ø9	G1	366	83	252	100	175	50	41	103
LOC3 016-4-D-A	496	526	687	203	510	Ø9	G1	427	83	280	62	300	50	46	107
LOC3 016-4-D-B	496	526	699	203	510	Ø9	G1	427	83	280	74	300	50	46	107
LOC3 016-4-D-C	496	526	712	203	510	Ø9	G1	427	83	280	87	300	50	46	107
LOC3 016-4-D-D	496	526	725	203	510	Ø9	G1	427	83	280	100	300	50	46	107
LOC3 016-6-D-C	496	526	738	203	510	Ø9	G1	427	83	280	87	300	50	46	107
LOC3 016-6-D-D	496	526	725	203	510	Ø9	G1	427	83	280	100	300	50	46	107
LOC3 023-4-D-B	580	610	729	356	610	Ø14	G1	509	98	322	74	385	65	44	104
LOC3 023-4-D-C	580	610	770	356	610	Ø14	G1	509	98	322	87	385	65	44	104
LOC3 023-4-D-D	580	610	783	356	610	Ø14	G1	509	98	322	100	385	65	44	104
LOC3 023-6-D-C	580	610	770	356	610	Ø14	G1	509	98	322	87	385	65	44	104
LOC3 023-6-D-D	580	610	783	356	610	Ø14	G1	509	98	322	100	385	65	44	104
LOC3 033-4-A-C	692	722	798	356	610	Ø14	G1 1/4	619	103	378	87	326	70	38	99
LOC3 033-4-A-D	692	722	810	356	610	Ø14	G1 1/4	619	103	378	100	326	70	38	99
LOC3 033-6-A-D	692	722	825	356	610	Ø14	G1 1/4	619	103	378	100	326	70	38	99
LOC3 044-4-A-C	629	866	823	356	610	Ø14	G1 1/4	780	103	450	87	504	70	59	99
LOC3 044-4-A-D	629	866	835	356	610	Ø14	G1 1/4	780	103	450	100	504	70	59	99
LOC3 044-6-A-D	629	866	850	356	610	Ø14	G1 1/4	780	103	450	100	504	70	59	99

Minor deviation for LOC2 and LOC3, please comtact your PARKER office for any inquiry

How to Order LOC Cooler

EXAMPLE: **LOC3 - 011 - 6 - A - C - L - 50 - S20 - D - 00 - 0**
1 2 3 4 5 6 7 8 9 10/11 12

1. TYPE OF COOLING SYSTEM = LOC3
LOC3 used for all sizes with IE2 motors

2. COOLER SIZE
004, 007, 011, 016, 023, 033, 044

3. NUMBER OF POLES, MOTOR	
4 - POLE	= 4
6 - POLE	= 6

4. VOLTAGE, FREQUENCY AND EFFICIENCY	
Worldwide	
No motor [4]	= 0
230/400V 50Hz - IE2 [1]	= A
460V 60Hz - IE2 [1]	= B
Single Phase 230V 50Hz (No IE)	= C
230/400V 50Hz & 460V 60Hz - IE2 [2]	= D
500V 50Hz - IE2	= E
400/690V 50Hz - IE2	= F
525V 50Hz & 575V 60Hz - IE2	= G
Motor for special voltage or frequency [5]	= X
1) For LAC-033 to 113	
2) For LAC2-007 to LAC2-023	
3) For other option contact PARKER for assistance	
4) Required Frequency to be mentioned at the end of description	
5) Stated in plan language at end of description	

5. PUMP DISPLACEMENT	
Displacement 15 cm³/r	= A
Displacement 30 cm³/r	= B
Displacement 45 cm³/r	= C
Displacement 60 cm³/r	= D

6. BY-PASS VALVE, PUMP	
No By-Pass valve	= 0
Built-in bypass Valve 5 bar Internal	= L
Built-in bypass Valve 10 bar Internal	= H
Built-in bypass Valve 5 bar External	= K
Built-in bypass Valve 10 bar External	= M

7. THERMO CONTACT	
No thermo contact	= 00
40 °C	= 40
50 °C	= 50
60 °C	= 60
70 °C	= 70
80 °C	= 80
90 °C	= 90

8. 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 LAC-002 - LAC-004	

9. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

10. FILTER UNIT	
No Filter Unit	= 0
Filter Unit	= X
Please contact PARKER Hannifin for guidance and information regarding Filter unit	

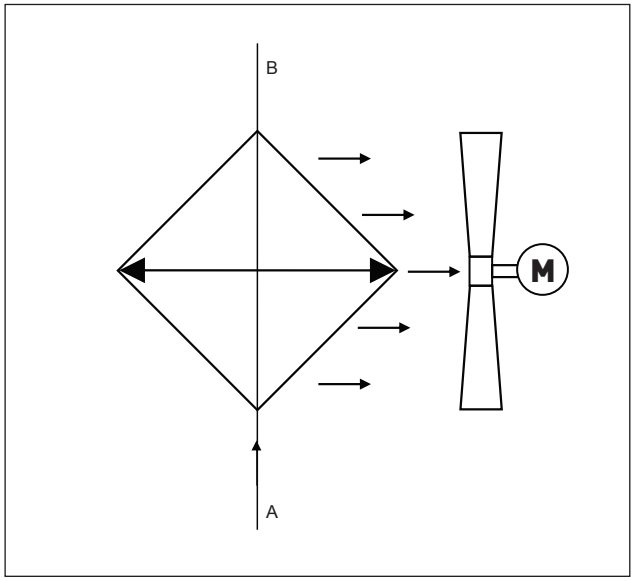
11. PRESSURE DROP INDICATOR	
No Pressure Drop indicator	= 0
Pressure Drop indicator	= Z

12. STANDARD/SPECIAL	
Standard	= 0
Special [1]	= Z
1) Stated in plan language at end of description	

Note:

DC Driven Fan Cooler

IN THIS SECTION



Features

- Clever design and the right choice of materials and components produce a long useful life, high availability and low service and maintenance costs.
- Compact design and low pressure drop and high cooling capacity.
- Easy to maintain and easy to retrofit in many applications.
- DC motor 12V/24V
- Quiet fan and fan motor.
- Compact design and low weight.

Why use LDC COOLER

The LDC air oil cooler with 12 or 24 V DC motor is optimized for use in the mobile industry. Together with a wide range of accessories, the LDC cooler is suitable for installation in most applications and environments. The maximum cooling capacity is 30 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.

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

COOLER MATRIX	
Maximum static working pressure	21 ba
Dynamic working pressure	14 bar*
Maximum oil inlet temperature	120 °C
* Tested in accordance with ISO/DIS 10771-1	

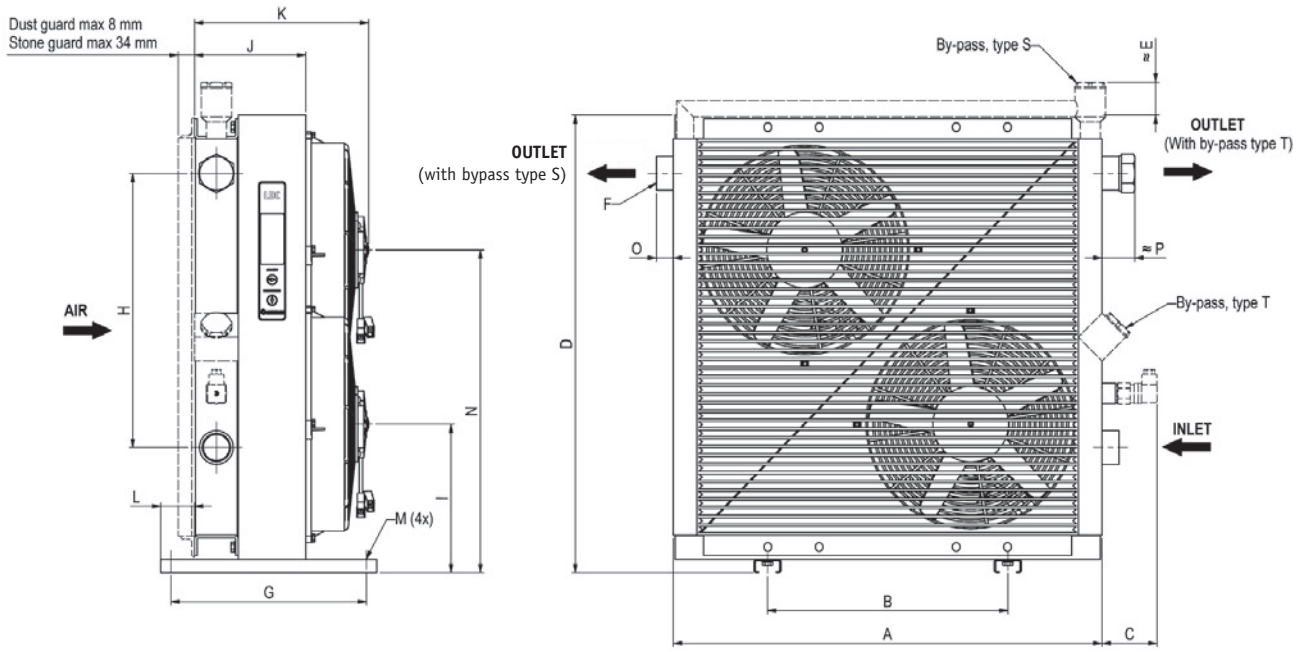
COOLING CAPACITY CURVES
The cooling capacity curves in this technical data sheet are based on tests in accor-dance with EN 1048 and have been produced using oil type ISO VG 46 at 60 °C.

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

CONTACT PARKER HANNIFIN FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

LDC	002	003	004	007-020	023-033
Speed (rpm)	3700	3670	3350	3060	3060
Protection std.	IP 68	IP 68	IP 68	IP 68	IP 68
Insulation class	H	H	H	H	H
Ambient temp.	-30°C - +80°C				
Power consump. (A) 12 V	6.5	8	8	20	2x20*
Power consump. (A) 24 V	3.5	4	4	10	2x10*
* = LDC 023 and LDC 033 uses two motors					

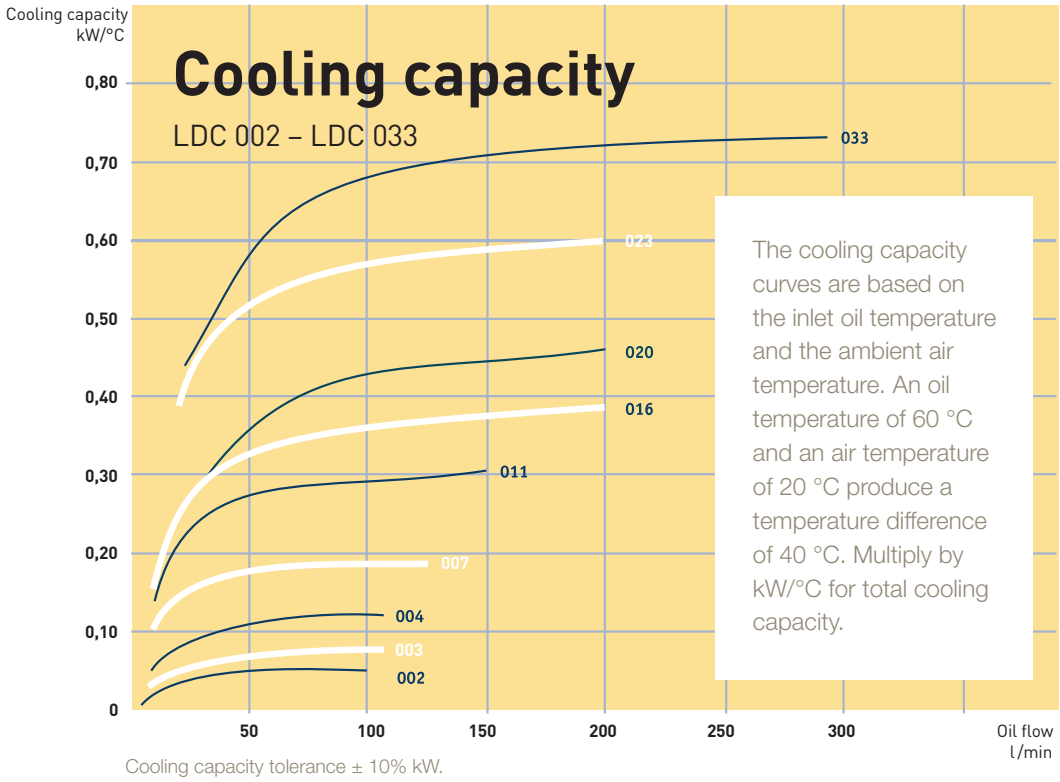
Dimensions,Weight,Noise



TYPE	A	B	C	D	E	F	G	H	I	J	K	L	Mø	N	O	P	Weight kg (approx)	Acoustic Pressure LpA dB(A)1m*
LDC 002	184	74	72	189	73	G½	190	72	97	105	157	39	9	-	11	25	4	66
LDC 003	244	134	82	227	69	G1	148	90	116	115	157	31	9x14	-	23	35	5	68
LDC 004	267	134	82	256	69	G1	148	90	131	115	162	31	9x14	-	23	35	6	68
LDC 007	330	203	82	345	54	G1	267	160	175	115	178	59	9	-	23	44	9	71
LDC 011	400	360	82	396	65	G1	101	230	200	125	218	-	9x29	-	23	44	12	74
LDC 016	464	416	82	466	63	G1	101	300	235	125	218	-	9x29	-	23	44	15	74
LDC 020	510	470	82	510	61	G1	101	280	257	125	211	-	9x29	-	23	44	18	77
LDC 023	615	356	46	635	26	G1	290	305	200	125	218	50	13	455	-	8	25	77
LDC 033	635	356	82	678	59	G1¼	290	406	220	165	258	50	13	478	25	49	30	77

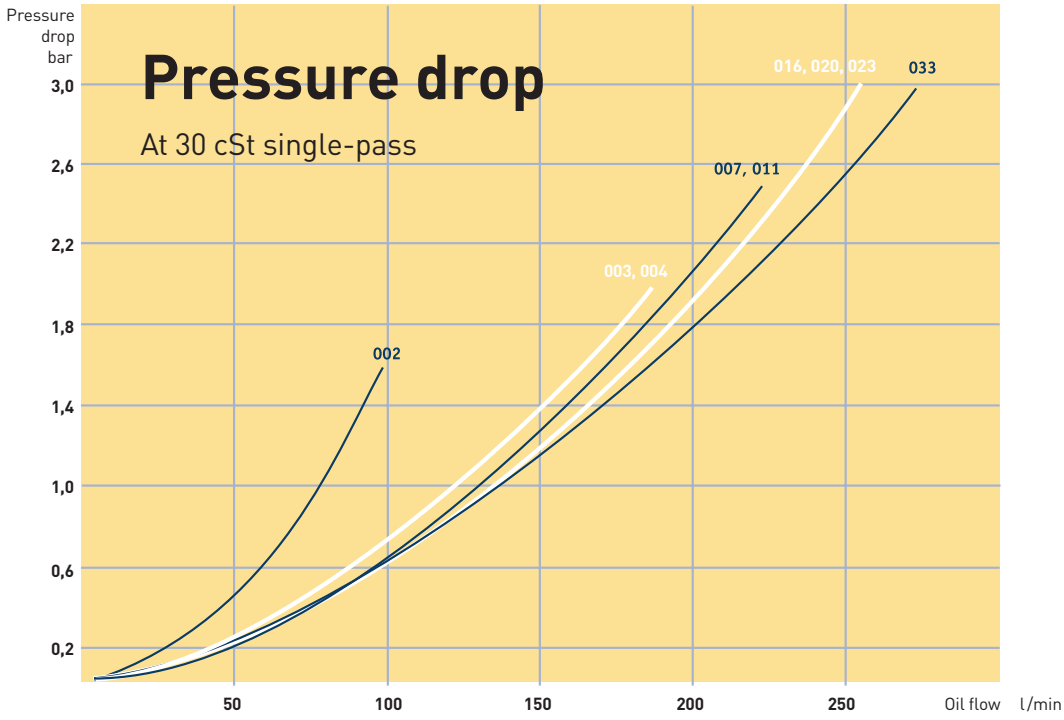
* = Noise level tolerance ± 3 dB(A)

Performance-cooling capacity



Cooling capacity tolerance ± 10% kW.

Pressure Drop



How to Order LDC Cooler

All positions must be filled in when ordering

EXAMPLE: **LDC - 016 - A - 0 - 00 - S20 - 0 -- 0**
1 2 3 4 5 6 7 8

1. AIR OIL COOLER WITH HYDRAULIC MOTOR = LDC

2. COOLER SIZE
002, 003, 004, 007, 011, 016, 023 and 033

3. MOTOR VOLTAGE	
12V	= A
24V	= B

4. Accessories for DC Motor	
No motor accessories	= 0
On/Off Relay box. Requires a thermo contact pos.5	= R
Smart DC Drive, soft start. Requires a thermo contact pos.5	= S

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 LAC-002 - LAC-004	

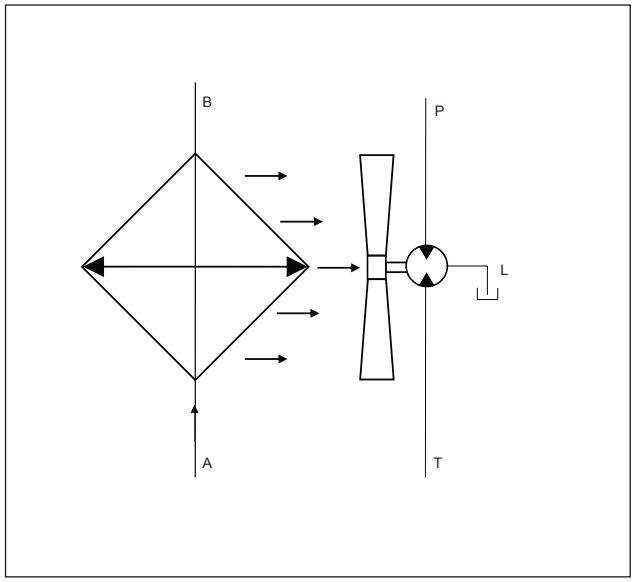
7. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

8. STANDARD/SPECIAL	
Standard	= 0
Special [1)]	= Z
1) Stated in plan language at end of description	

Note:

Hydraulic Driven Fan Cooler

IN THIS SECTION



Features

- Clever design and the right choice of materials and components produce a long useful life, high availability and low service and maintenance costs.
- Compact design and low weight.
- Easy to maintain and easy to retrofit in many applications.
- Hydraulic motor with displacement from 8.4 cm^3/r to 25.2 cm^3/r
- Collar bearing for fan motor on larger models provides longer useful life.
- Quiet fan and fan motor.
- Cooler matrix with low pressure drop and high cooling capacity.

Why use LHC COOLER

The LHC air oil cooler with hydraulic motor is optimized for use in the mobile and industrial sector. Together with a wide range of accessories, the LHC 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 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.

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

COOLER MATRIX	
Maximum staticoperating pressure	21 bar
Dynamic operatingpressure	14 bar*
Heat transfer limit	± 6 %
Maximum oil inlettemperature	120 °C
* Tested in accordance with ISO/DIS 10771-1	

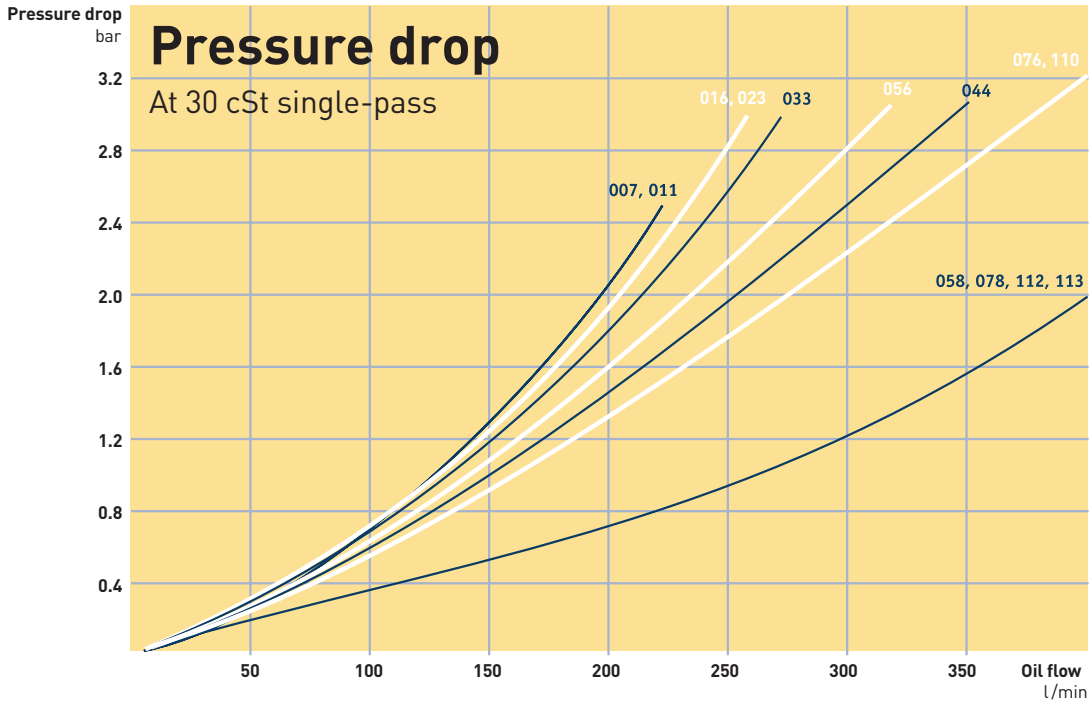
COOLING CAPACITY CURVES
The cooling capacity curves in this technical data sheet are based on tests in accordance with EN 1048 and have been produced using oil type ISO VG 46 at 60 °C.

CONTACT PARKER HANNIFIN FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

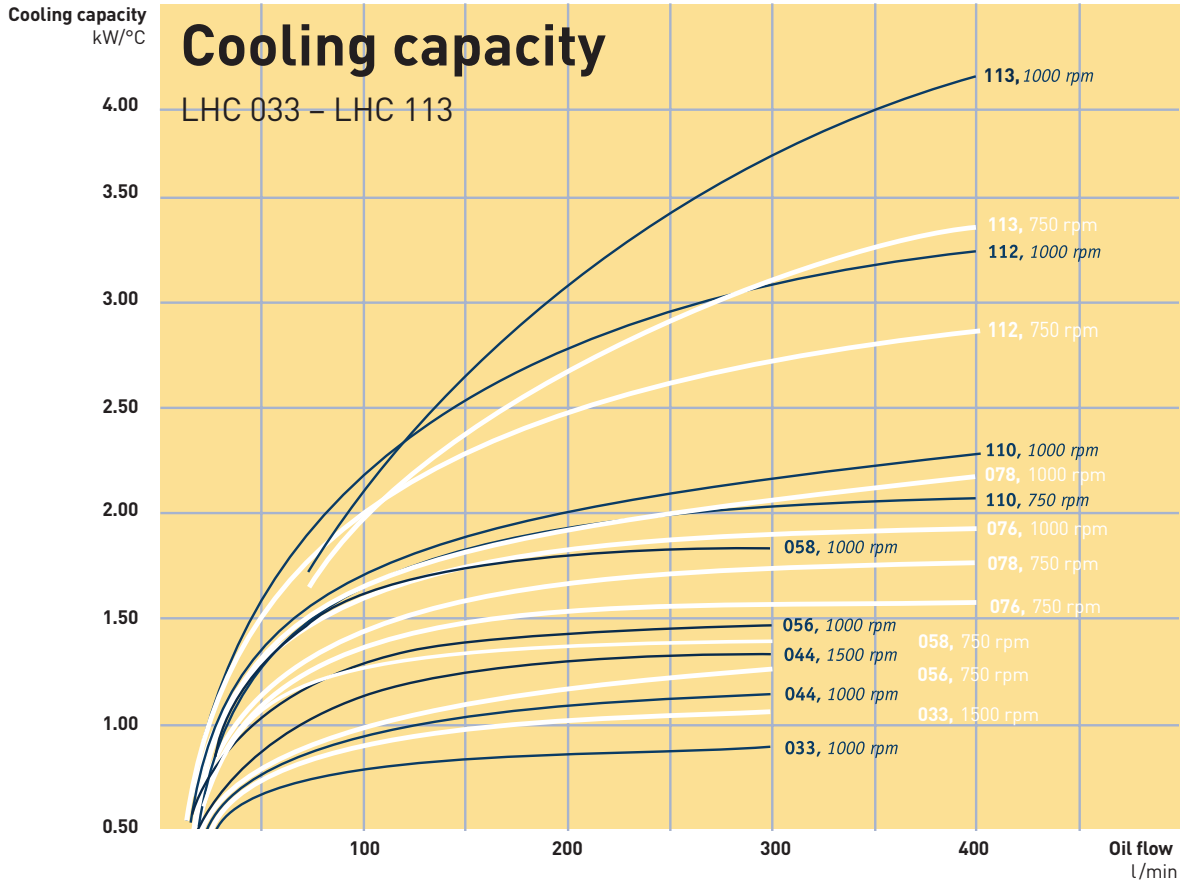
Models, capacities, Noise and Weight

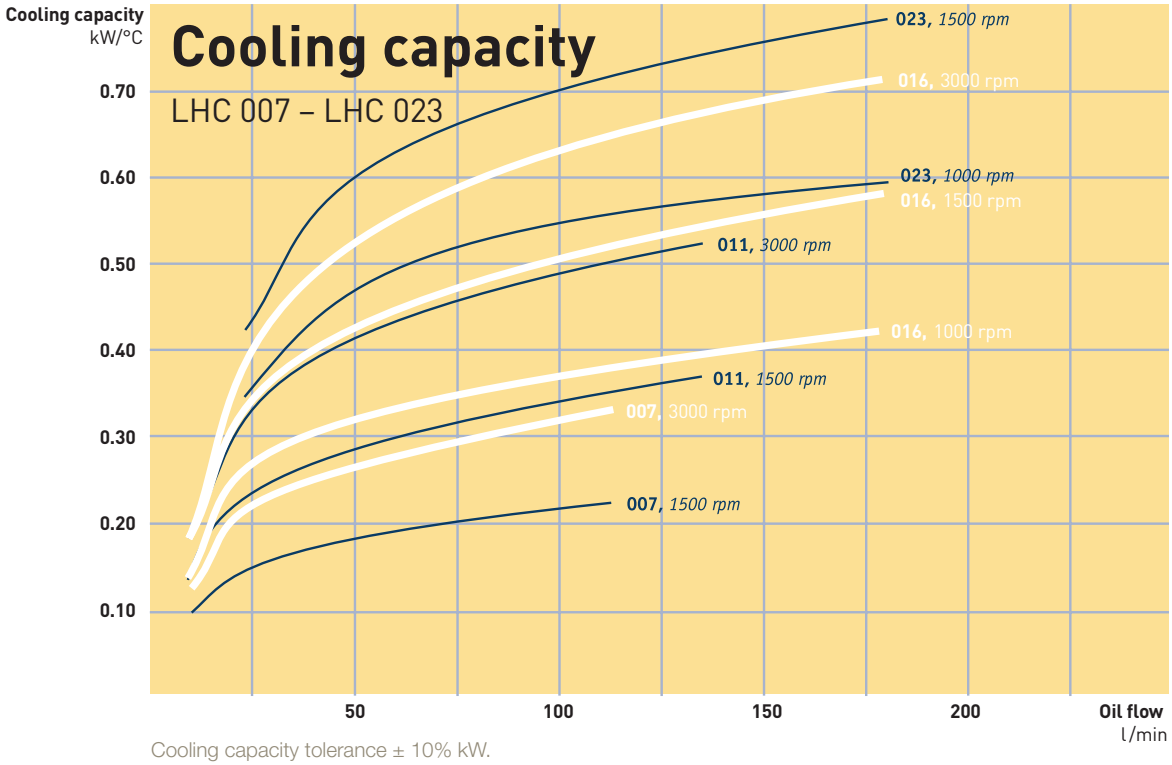
TYPE	Fan speed rpm	Fan capacity kW	Weight kg (approx)	Max fan speed rpm @ 40 °C	Acoustic pressure level LpA dB(A) 1m*
LHC2 007	1500	0.10	10	3500	62
	3000	0.65	10	3500	79
LHC2 011	1500	0.20	15	3500	67
	3000	1.50	15	3500	82
LHC2 016	1000	0.10	18	3500	60
	1500	0.35	18	3500	70
	3000	2.50	18	3500	86
LH C2 023	1000	0.15	30	3500	64
	1500	0.50	30	3500	76
LHC 033	1000	0.65	40	2900	75
	1500	2.00	40	2900	85
LHC 044	1000	0.70	56	2900	77
	1500	2.00	56	2900	86
LHC 056	750	0.75	70	2400	74
	1000	1.80	70	2400	82
LHC 058	750	0.75	77	2400	75
	1000	1.80	77	2400	83
LHC 076	750	0.70	105	2200	80
	1000	1.60	105	2200	87
LHC 078	750	0.70	111	2200	81
	1000	1.60	111	2200	88
LHC 110	750	1.70	117	1900	85
	1000	4.00	117	1900	91
LHC 112	750	1.70	125	1900	86
	1000	4.00	125	1900	92
LHC 113	750	1.70	184	2400	87
	1000	4.00	184	2400	93
LHC 200	Please contact Parker for more information				

Pressure Drop



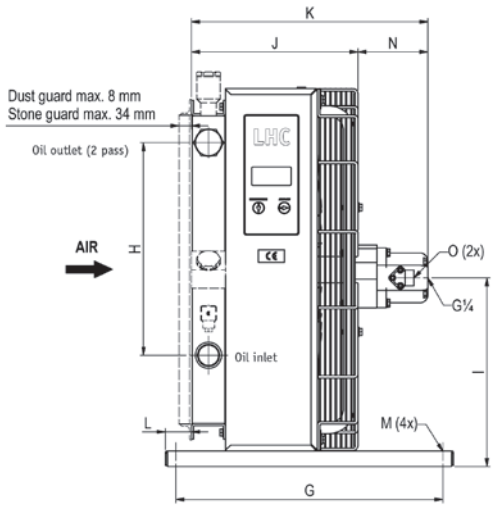
Performance

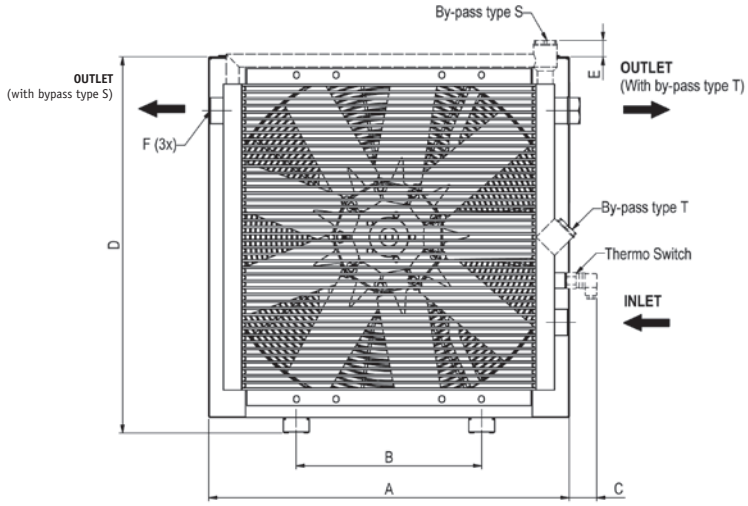




Cooling capacity tolerance ± 10% kW.

Dimensions





TYPE	A	B	C	D	E	F	G	H	I	J	K	L	Mø
LHC2 007	365	203	64	395	42	G1	510	160	197	225	J+N	50	9
LHC2 011	440	203	62	470	41	G1	510	230	234	249	J+N	50	9
LHC2 016	496	203	66	526	46	G1	510	230	262	272	J+N	50	9
LHC2 023	580	356	44	610	44	G1	510	305	304	287	J+N	50	9
LHC 033	692	356	42	722	42	G1¼	510	406	360	318	J+N	50	9
LHC 044	692	356	59	866	59	G1¼	510	584	432	343	J+N	50	9
LHC 056	868	508	49	898	43	G1¼	510	584	448	368	J+N	50	9
LHC 058	868	508	49	898	43	G2	510	584	448	388	J+N	30	9
LHC 076	1022	518	41	1052	45	G1½	610	821	525	393	J+N	70	14
LHC 078	1022	518	41	1052	45	G2	610	821	525	413	J+N	50	14
LHC 110	1185	600	54	1215	45	G2	610	985	607	418	J+N	70	14
LHC 112	1185	600	54	1215	45	G2	610	985	607	438	J+N	50	14
LHC 113	1200	600	82	1215	45	G2	610	985	607	485	J+N	132	14

MOTOR	Displacement cm^3/r	N LHC2 007 – LHC2 023	N LHC 033 – LHC 112	O Angular 90° connection	Max. working pressure bar
A	8.4	91	133	G½	250
B	10.8	98	138	G½	250
C	14.4	101	144	G½	250
D	16.8	105	148	G¾	250
E	19.2	110	151	G¾	250
F	25.2	120	165	G¾	250

Key for LHC/LHC2 Air Oil Coolers

All positions must be filled in when ordering

EXAMPLE: **LHC2 - 016 - A - 50 - T20 - D - 0**
1 2 3 4 5 6 7

1. AIR OIL COOLER WITH HYDRAULIC MOTOR = LHC/LHC2
LHC2 only valid for size 007 to 023 equipped with hydraulic motor

2. COOLER SIZE
007, 011, 016, 023, 033, 044, 056, 058, 076, 078, 110, 112, 113 and 200

3. HYDRAULIC MOTOR DISPLACEMENT	
No hydraulic motor	= 0
Displacement 8.4 cm^3/r	= A
Displacement 10.8 cm^3/r	= B
Displacement 14.4 cm^3/r	= C
Displacement 16.8 cm^3/r	= D
Displacement 19.2 cm^3/r	= E
Displacement 25.2 cm^3/r	= F
Special	= X
X: pressure, displacement, installation sizes, etc. must be stated in plain language	

4. THERMO CONTACT	
No thermo contact	= 00
40 °C	= 40
50 °C	= 50
60 °C	= 60
70 °C	= 70
80 °C	= 80
90 °C	= 90

5. 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 LAC-002 - LAC-004	

6. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

7. STANDARD/SPECIAL	
Standard	= 0
Special [1)]	= Z
1) Stated in plan language at end of description	

LHC-M cooler for Marine Application

Why use LHC-M COOLER

LHC-M air oil cooler Hydrandic motor is designed to resist aggressive environments such as marine, offshore and coastal environments, environments with a high level of contamination such as chemical industries, refineries etc. Maximum cooling capacity is 300 kW at ETD 40 °C. All components are thoroughly selected for optimal performance and corrosion resistance.

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	Glass fibre reinforced polypropylene (PPG)
Fan Hub	Aluminum
Motor Hub	Aluminum
Hydraulic Motor	Aluminum or Cast iron
Fan housing	Steel
Fan guard	Steel
Dust Guard	Stainless Steel
Other parts	Steel
Thermo-contact	Brass

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

SURFACE TREATMENT	
Cooler Matrix	Black Powder Coated
Fan Blades	Black Powder Coated
Motor Hub (Size 033 and up)	Black Anodized
Electric Motor	Painted Black
Other parts	Pre-heated and black Powder Coated

THERMO CONTACT	
Protection Class	IP 67
Maximum Oil temperature	120 °C

COOLING CAPACITY CURVES
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 OLAER FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

How to Order LHC-M Cooler

EXAMPLE: LHC2-M - 016 - A - 50 - T20 - D - 0
1 2 3 4 5 6 7

1. MARINE AIR OIL COOLER WITH HYDRAULIC MOTOR = LHC-M/LHC2-M
LHC2-M only valid for size 007 to 023 equipped with hydraulic motor

2. COOLER SIZE
007, 011, 016, 023, 033, 044, 056, 058, 076, 078, 110, 112, 113 and 200

3. HYDRAULIC MOTOR DISPLACEMENT	
No hydraulic motor	= 0
Displacement 8.4 cm^3/r	= A
Displacement 10.8 cm^3/r	= B
Displacement 14.4 cm^3/r	= C
Displacement 16.8 cm^3/r	= D
Displacement 19.2 cm^3/r	= E
Displacement 25.2 cm^3/r	= F
Special	= X
X: pressure, displacement, installation sizes, etc. must be stated in plain language	

4. THERMO CONTACT	
No thermo contact	= 00
40 °C	= 40
50 °C	= 50
60 °C	= 60
70 °C	= 70
80 °C	= 80
90 °C	= 90

5. 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 LAC-002 - LAC-004	

6. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

7. STANDARD/SPECIAL	
Standard	= 0
ABS PDA approval	= A
Special [1)]	= Z
1) Stated in plan language at end of description	

LHC-X cooler for Surface Explosive environment

Why use LHC-X COOLER

LHC-X air oil cooler is intended for cooling of hydraulic fluids in industrial systems in areas where potentially explosive atmospheres may occur, above ground.

The LHC-X is defined and approved as a non-electrical device. Tcal parts of the LHC-X are safe for use in potentially explosive atmospheres caused by gases, vapours or mists classified as Zone 1 (and 2) and also in potentially explosive atmospheres caused by air/dust mixtures classified as Zone 21 (and 22). A cooler supplied by PARKER is approved for explosive atmospheres according to the customer's request.

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	Anti static glass reinforced polyamide - PAGAS
Fan Hub	Aluminum
Motor Hub	Aluminum
Electrical Motor	Aluminum or Cast iron
Fan housing	Steel
Fan guard	Steel
Dust Guard	Stainless 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	

COOLING CAPACITY CURVES
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 OLAER FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

How to Order LHC-X Cooler

EXAMPLE: LHC2-X - 016 - A - 50 - T20 - D - 0
1 2 3 4 5 6 7

1. ATEX AIR OIL COOLER WITH HYDRAULIC MOTOR = LHC-X/ LHC2-X
LHC2-X only valid for size 007 to 023 equipped with hydraulic motor

2. COOLER SIZE
007, 011, 016, 023, 033, 044, 056, 058, 076, 078, 110, 112, 113 and 200

3. HYDRAULIC MOTOR DISPLACEMENT	
No hydraulic motor	= 0
Displacement 8.4 cm^3/r	= A
Displacement 10.8 cm^3/r	= B
Displacement 14.4 cm^3/r	= C
Displacement 16.8 cm^3/r	= D
Displacement 19.2 cm^3/r	= E
Displacement 25.2 cm^3/r	= F
Special	= X
X: pressure, displacement, installation sizes, etc. must be stated in plain language	

4. THERMO CONTACT	
No thermo contact	= 00
40 °C	= 40
50 °C	= 50
60 °C	= 60
70 °C	= 70
80 °C	= 80
90 °C	= 90

5. 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 LAC-002 - LAC-004	

6. MATRIX GUARD	
No guard	= 0
Stone guard	= S
Dust guard	= D
Dust and stone guard	= P

7. STANDARD/SPECIAL	
Standard - GAS Environment	= 0
Standard - DUST Environment	= D
Standard - GAS&DUST Environment	= E
Special [1]	= Z
1) Stated in plan language at end of description	

ATEX COOLER ORDERING FORM

This form should be fully completed and signed and submitted to technical departement with sales order for approval

Customer:		Application type :	
Parker Sales:		Parker S/O Nb:	

This document needs to be fully filled by Customer
PARKER will not be liable for any uncomplete or incorrect statement about application information

	LAC	LHC
Cooler Type	AC motor ATEX	Hydraulic motor ATEX

	Temperature
Thermoswitch	50°C 60°C 70°C 80°C No

GROUP as per CE 94/9/CE AND ZONE								
	GAS (G)				DUST (D)			
Explosion Group	*I* ☐		II ☐		*I* ☐		II ☐	
Zone		*0* ☐	1 ☐	2 ☐		*20* ☐	21 ☐	22 ☐

Zone 1 Covers Zone 2 - Zone 21 Covers Zone 22

EQUIPMENT CATEGORY		
	GAS (G)	DUST (D)
Explosion Proof Motor	☐ IIA ☐ IIB ☐ IIC	☐ IIIA ☐ IIIB ☐ IIIC
Explosion Proof Motor	☐ EEx-de	☐ Other : _____
Motor Temperature Class	☐ T4 (135°C)	☐ Other : _____
Protection Class	☐ IP55	☐ Other : _____
Motor Origin	☐ Chinese made motor allowed ☐ European motor only	☐ Other : _____

Voltage (V)	
Frequency (Hz)	

Any Special requirement should be clearly identified below :

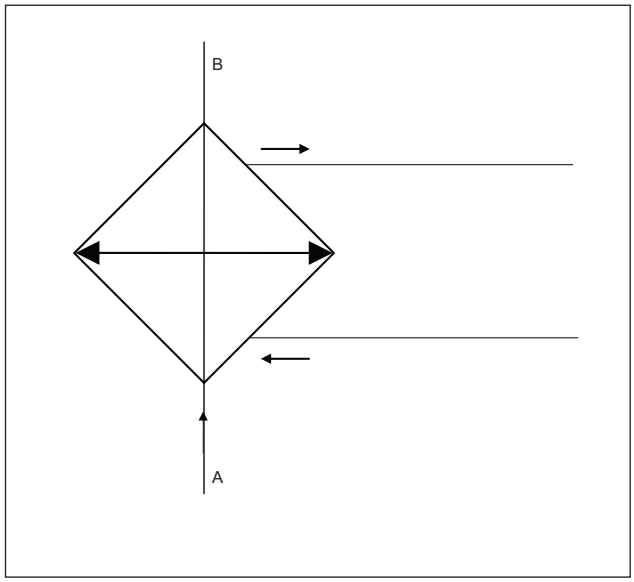
All information above to be provided to Parker for cooler selection
PARKER will submit Cooler code and Motor Datasheet for final approval by customer and confirmation by signature
Signature of this datasheet will state that both parties understand and agrees technical informations for production

Customer Signature :		PARKER Sales Signature :		Parker Technical Signature :	
Date :		Date :		Date :	

Note:

PWO-Brazed Plate Cooler

IN THIS SECTION



Features

- Light and compact
- Suitable for many applications
- Ease of installation
- Cost efficient and environmentally friendly

Why use PWO

The PWO is a compact and lightweight water oil cooler with a high cooling capacity for the cooler size. This lightweight and compact water oil cooler consists of corrugated channel plates sandwiched between the front and rear cover plates. The channel plates are pressed and vacuum brazed in the same automated procedure, and with rigorous standards of quality control. The unique plate design provides high turbulent flow conditions throughout the cooler, the key to efficient cooling. This turbulent flow reduces the risk for clogging, which in turn makes this PWO virtually maintenance free.

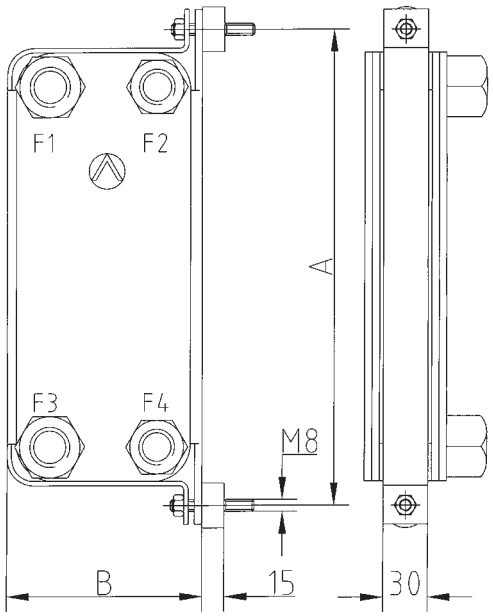
Specification

TYPE	Max temp Temp °C	Min temp Temp °C	Working pressure 155°C bar	Test pressure bar	Empty weight kg * = x number of plates
B5TH	225	-196	31	50	1 + 0.04*
B8TH	225	-196	31	50	1 + 0.07*
B10TH	225	-196	31	50	1 + 0.09*
B12H	225	-196	31	50	2 + 0.12*
B15H	225	-196	31	50	1 + 0.11*
B16H	225	-196	28	45	2 + 0.11*
B25TH	225	-196	31	50	2 + 0.17*
B28H	225	-196	28	45	2 + 0.17*
B35H	225	-196	31	50	7 + 0.34*
B120TH	225	-196	31	50	10 + 0.43*
B56H	225	-196	31	50	16 + 0.43*

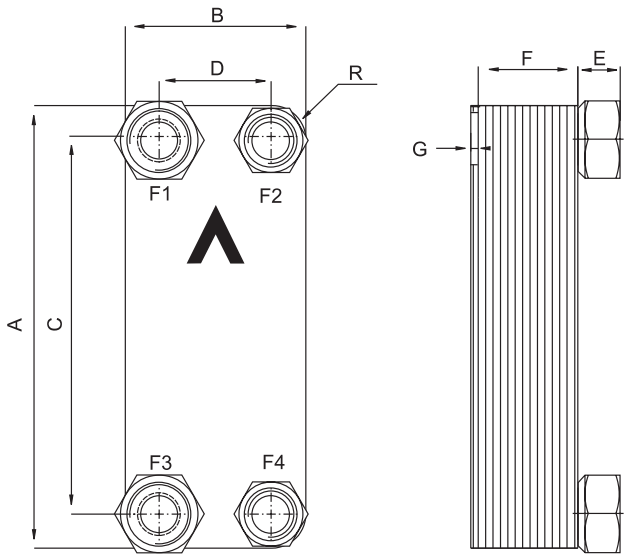
Material:
Plates: EN 10028/7-1.4401 (AISI 316)
Brazing: Pure copper
Connections: EN 10272-1.4401 (AISI 316)

Units size >B35-90 should always be fixed with two clamps per cooler >B35-90

Clamp Type	A	B
FK-B5TH	219	90
FK-B8TH	342	90
FK-B10TH, B12H	319	135
FK-B15H	496	90
FK-B16H	408	139
FK-B25TH, B28H	554	135
FK-B35H	422	259
FK-B56H/B120TH	554	259



PWO STANDARD range of water oil coolers is available in a wide number of sizes and is in general available for immediate off-the-shelf delivery. The basic material is AISI 316 stainless steel, vacuum brazed with pure copper. PWO requires little refrigerant volume resulting in lower cost and a more environmentally-friendly installation. Low installation cost allows for oversizing to accommodate for future increase in requirements or peak loads.



Dimensions,Models and Weight

TYPE	A mm (±2)	B mm (±1)	C mm (±1)	D mm (±1)	E mm (±1) (+0.5% - 1.5%)	F * = x number of plates (±1)	G mm	R mm
B5TH	187	72	154	40	20.1 2 x 3/4"- 2 x 1/2"	2.24 x * + 4	7	16
B8TH	310	72	278	40	20.1 2 x 3/4"- 2 x 1/2"	2.24 x * + 4	7	16
B10TH	289	119	243	72	27.1 2 x 1"- 2 x 3/4"	2.24 x * + 4	6	22
B12H	287	117	234	63	27.1 2 x 11/4"- 2 x 1"	2.24 x * + 4	6	22
B15H	465	72	432	40	20.1 2 x 3/4"- 2 x 1/2"	2.24 x * + 4	7	16
B16H	376	119	320	63	27.1 2 x 11/4"- 2 x $1^{1/4"}$	2.24 x * + 4	6	23
B25TH	526	119	479	72	27.1 2 x 11/4"- 2 x 1"	2.24 x * + 4	6	23
B28H	526	119	470	63	27.1 2 x 11/4"- 2 x $1^{1/4"}$	2.24 x * + 4	6	23
B35H	393	243	324	174	27.1 2 x 11/2"- 2 x $1^{1/4"}$	2.34 x * + 8	3	35
B120TH	525	243	456	174	27.1 2 x 11/2"- 2 x $1^{1/4"}$	2.29 x * + 10	4	35
B56H	525	243	430	148	54.2 ISO G 4 x $2^{1/2"}$	2.44 x * + 14	3	48

How to Order PWO Cooler

EXAMPLE: PWO - B8T - 20 - 0 - B - 0 - 0
1 2 3 4 5 6 7

1. OIL to WATER PLATE COOLER = PWO

2. PLATE TYPE and MODEL
B5T, B8T, B10T, B12H, B15, B16, B25T, B28, B35, B56 and B120T K5, K10, K16, K25 and K45

3. NUMBER OF PLATE

4. CONNECTIONS	
Standard (as per catalog)	= 0
Special [1]	= X
1) Stated in plan language at end of description	

5. BRACKET	
No Bracket	= 0
Single Bracket	= A
Double Bracket	= B

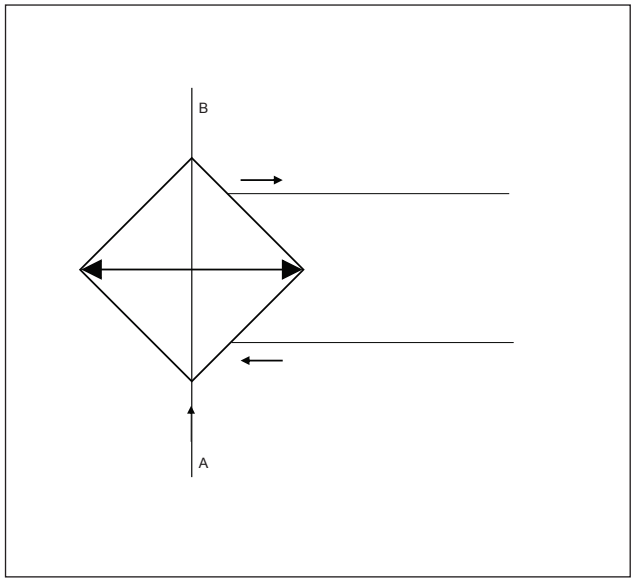
6. PLATE MATERIAL	
Standard - AISI316 for B type, AISI304 for K Type	= 0
Special Material	= X
1) Stated in plan language at end of description	

7. STANDARD/SPECIAL	
Standard	= 0
Special [1]	= Z
1) Stated in plan language at end of description	

Note:

GWO-Gasket Plate Cooler

IN THIS SECTION



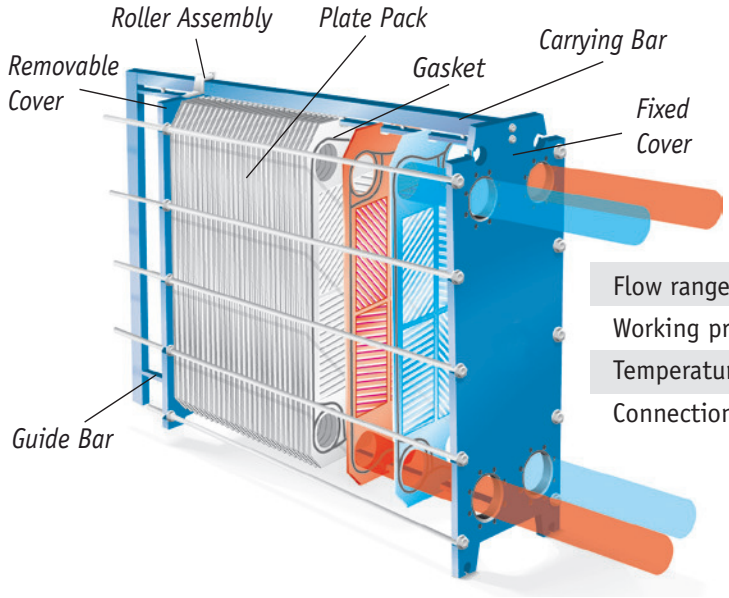
Features

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

Why use GWO

The GWO type of water oil cooler is built on a module-based concept and is designed to provide maximum efficiency in transferring heat from one liquid to another. Frames, plates and connections can be combined to form a number of different water oil coolers.
By using different types of plates, with different characteristics, the water oil coolers can be adapted to a wide variety of applications. The benefit of the GWO cooler is that it can easily be expanded or adapted, by adding or replacing plates when conditions change.

Specification

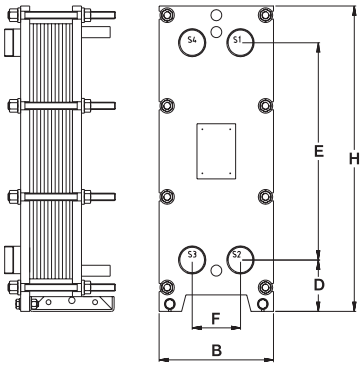


Flow ranges:	0 – 4600 m³/h
Working pressure:	10 – 25 bar
Temperature range:	-30°C – +180°C
Connections:	DN25 – DN500
	Welded neck, flange or threaded

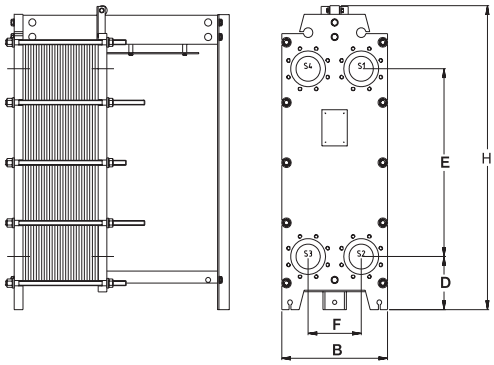
Specifications may be changed without prior notice.
Please contact us for specific details.

Dimensions and Weight

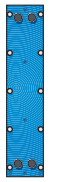
Frame type NI and PI



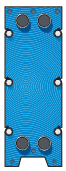
Frame type N and P



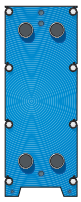
Type	Connection DN	B mm	H mm	D mm	E mm	F mm
GX-007 PI GC-008 PI	25/32	180	774	72	640	60
GC-009 PI GC-009 P GD-009 P GD-009 PI	40	250	725	90	555	100
GL-013 P GL-013 PI GL-013 N GL-013 NI GD-013 P GD-013 PI GC-016 P GC-016 PI GC-016 N GL-016 PI GD-016 P GD-016 PI	50/65	320	832	140	592	135
GX-026 N GC-026 N	100	450	1166	220	779	226
GX-026 P GC-026 P GD-026 P	100	450	1265	220	779	226
GX-042 N GC-044 N	100	450	1166	220	1189	226
GX-042 P GC-044 P GD-042 P	100	450	1675	220	1189	226
GX-051 N GC-051 N GC-054 N	150	585	1730	300	1143	300
GX-051 P GC-051 P GC-054 P	150	630	1730	300	1143	300



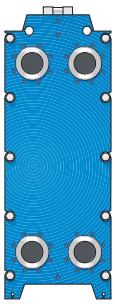
GC-008
GX-007



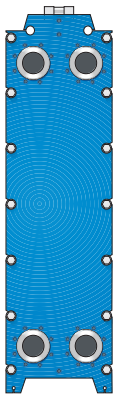
GC-009
GD-009



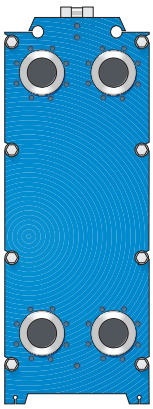
GL-013
GC-016
GD-013



GX-026
GC-026
GD-026



GX-042
GC-044
GD-042



GX-051
GC-051
GC-054

How to Order GWO
Key for Gasketed Water Oil Coolers

EXAMPLE:

GWO	GXD	-	051	-	H	-	5	-	P	-	159	-	1.4401	-	NBR (P)
	1 2		3		4		5		6		7		8		9

1. Plate system
GX = Ultraflex
GL = Standard (neutral plane)
GC = Standard (bottom plane)
GD = Double wall

2. Flow
D = Diagonal flow
P = Parallel flow

3. Cooler size
(051 is approx. 0.51 m2)

4. Chanel type
H = High-theta plates
L = Low-theta plates
M = Mix of high-, and low-theta plates

5. Plate thicknes
4 = 0,4 mm
5 = 0,5 mm
6 = 0,6 mm
7 = 0,7 mm

6. Type of FRAME
N = 10 bar
P = 16 bar
S = 25 bar

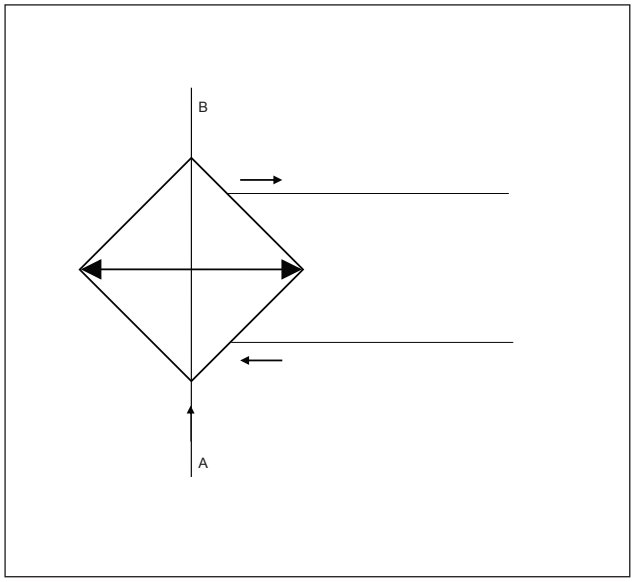
7. Number of plates
159 = plate package consists of 159 plates

8. Plate material
1.4301 = Stainless steel (AISI304 / SS2333)
1.4401 = Acid proof steel (AISI316 / SS2347)
1.4547 = 254SMO
3.7025 = Titanium Gr. 1

9. Gasket material
NBR (P)
FKM

Shell&Tube Cooler

IN THIS SECTION



Features

- Working pressure standard 15 bar
- Form 4 to 10" diameter.
- form 100 to 1800 mm
- Working temperature up to +100°C
- Flow range up to 900l/min
- Removable and fixed tube bundle.
- Many different material configuration available.

Shell&Tube cooler

Why Use Shell & Tube cooler

Two fluids, of different starting temperatures, flow through the water oil cooler. One fluid flows through the internal tubes and the other flows around the tubes inside the shell. Heat is transferred from one fluid to the other through the tube walls, either from inside the tubes to the surrounding fluid or vice versa.

Gearbox lubrication system.

Shell and Tube water/oil coolers in short:

- Robust and reliable
- Light and compact
- Suitable for many applications
- Easy installation
- Cost-efficient

The PARKER Shell and tube can be used in many different applications.

- Industrial: Gearbox and machinery cooling (e.g. injection molding machine) - OST&PST
- Mobile: Transmission cooling— PST
- Pulp&Paper—Process cooling - SST

Contact your PARKER representative for more information.

Product Specification:

MATERIAL			
Cooler matrix	PST	OST	SST
Shell	Carbon Steel	Shell	Stainless Steel (304 or 316)
Tubes	Copper with Aluminum fins	Copper with Aluminum fins	Stainless Steel (304 or 316)
Covers	Cast Iron	Cast Iron	Stainless Steel (304 or 316)
Bundle Configuration	Fixed	Removable	Fixed

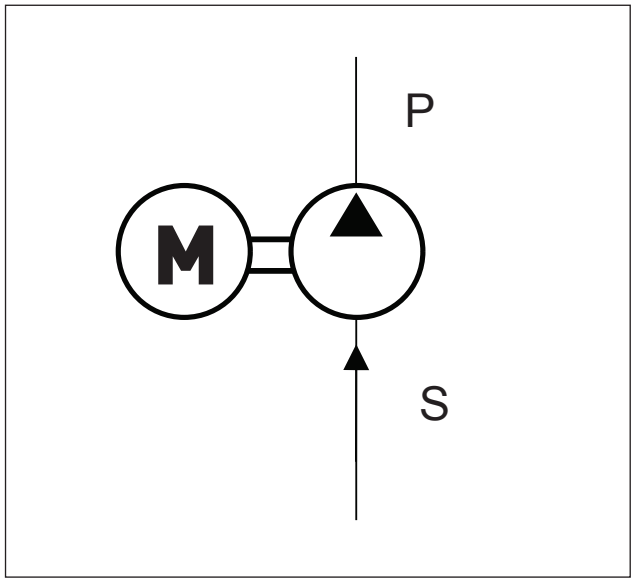
FLUID COMBINATIONS	
Mineral oil	HL/HLP in accordance with DIN 51524
Oil/water emulsion	HFA, HFB in accordance with CETOP RP 77H
Water glycol	HFC in accordance with CETOP RP 77H
Phosphate ester	HFD-R in accordance with CETOP RP 77H

TECHNICAL DATA,	
Maximum static operating pressure—Oil Side	22 bar
Maximum static operating pressure—Oil Side	15 bar
Maximum oil inlet temperature	100 °C

CONTACT OLAER FOR ADVICE ON
Oil temperatures > 120 °C
Oil viscosity > 100 cSt
Aggressive environments
Ambient air rich in particles
High-altitude locations

QPM3

IN THIS SECTION

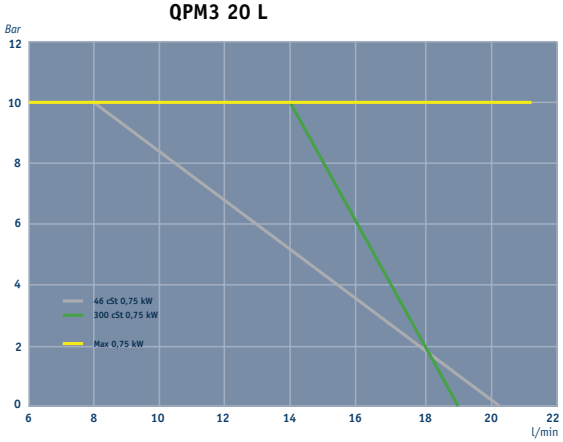


Features

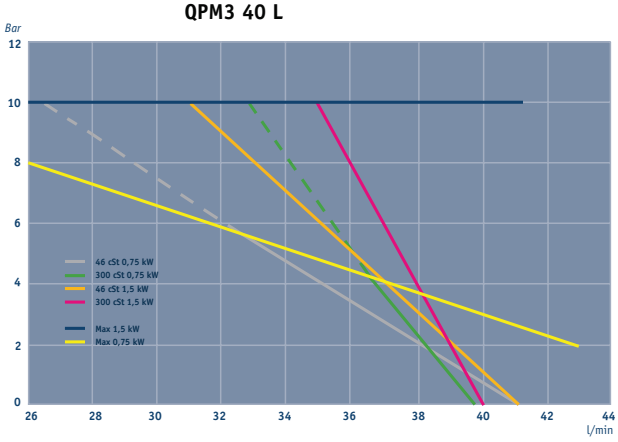
- Mineral oils
- Synthetic oils
- Vegetable oils
- Bypass valve Internal or external bypass valve with opening pressure 5 or 10 bar.
- Optimized QPM3 is optimized for use in Olaer's DUO3 oil filters, WEGO3 cooling and filter systems and LOC types of cooling systems.
- Cost effective Simple and robust design = cost effective.
- Consult your local Olaer office for:Special models, Dimensioning, Extreme operating conditions

Performance

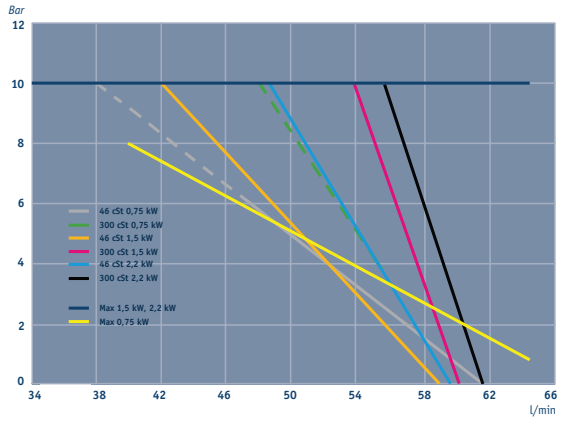
QPM3 20 L



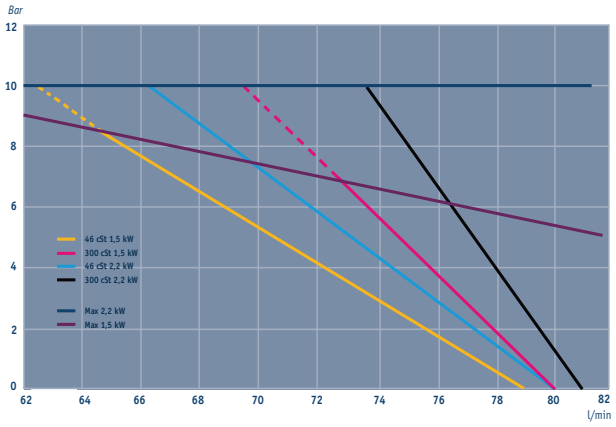
QPM3 40 L



QPM3 60 L

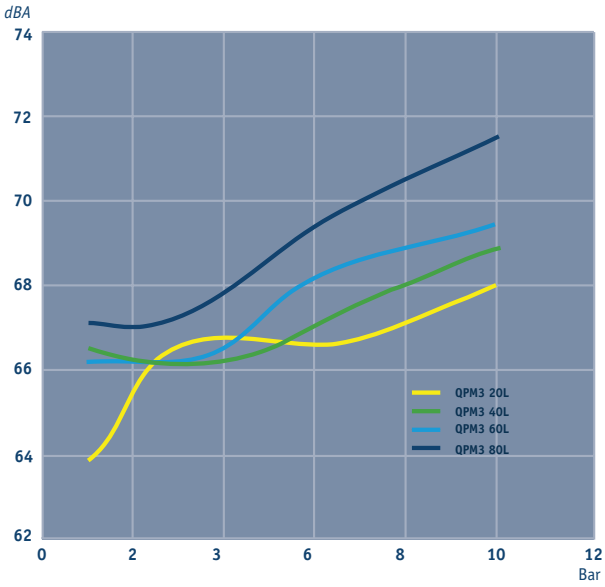


QPM3 80 L



Models, capacities, Noise and Weight

Acoustic power diagram for QPM3 Pump



Motor:

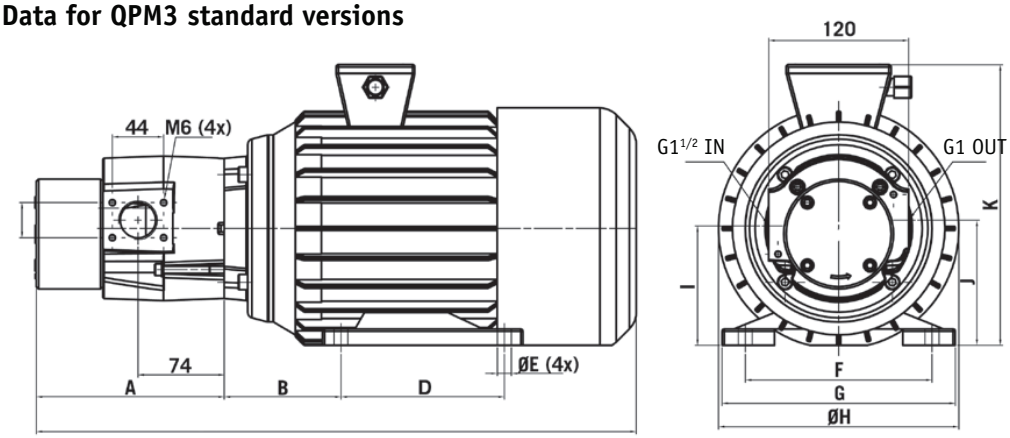
1,5 kW 4-pole

Ambient temp.: 20°C

Viscosity: 100 cSt

Standard: ISO 3741

Data for QPM3 standard versions



C (Varies with make of motor)

TYPE	Number of poles	Motor power kW	Pump flow l/min	Weight* kg	Acoustic pressure level LpA dB(A) at 1 m**	Dimensions in mm										
						A	B	C*	D	E	F	G*	H*	I	J	K*
QPM3 10	8	0.25	10	13	65	136	50	368	100	10	125	160	157	82	87	195
QPM3 20	4	0.75	20	13	65	136	50	368	100	10	125	160	157	82	87	195
QPM3 20	4	1.5	20	21	66	136	83	443	125	10	140	170	185	92	97	220
QPM3 40	4	0.75	40	13	65	148	50	381	100	10	125	160	157	82	87	195
QPM3 40	4	1.5	40	21	66	148	83	456	125	10	140	170	185	92	97	220
QPM3 40	4	2.2	40	28	67	148	100	502	140	12	160	200	206	102	107	240
QPM3 40	4	3	40	28	67	148	100	502	140	12	160	200	206	102	107	240
QPM3 60	4	0.75	60	14	65	161	50	393	100	10	125	160	157	82	87	195
QPM3 60	4	1.5	60	22	66	161	83	468	125	10	140	170	185	92	97	220
QPM3 60	4	2.2	60	28	67	161	100	514	140	12	160	200	206	102	107	240
QPM3 60	4	3	60	28	67	161	100	514	140	12	160	200	206	102	107	240
QPM3 80	4	1.5	80	22	67	174	83	481	125	10	140	170	185	92	97	220
QPM3 80	4	2.2	80	28	67	174	100	527	140	12	160	200	206	102	107	240
QPM3 80	4	3	80	28	67	174	100	527	140	12	160	200	206	102	107	240

** Depends on motor make*
*** Noise level tolerance ± 3 dB(A)*

Why use QPM3

Properties

Olaer's QPM range of gerotor type of low pressure pumps has been a big seller on the market for many years. High performance, light and compact, low noise level as well as low energy consumption are strong arguments for having a QPM3 installed in your system for the circulation of oil. The QPM3 pump has a dual shaft bearing and a resilient connection that guarantees safe and secure operation. The pump conforms to standard EN 60034-1/IEC 60072, version B3/B14, which allows the use of different makes of electric motor.

Specification

TECHNICAL DATA	
Pump housing/pump cover	aluminium with anodized surfaces
Gerotor	sintered steel
O-rings/sealings	nitrile
3-phase, 4-pole, asynchronous motor equipped with support and flange	
Pump capacity	10 - 80 l/min

ELECTRIC MOTOR	
Voltage	ΔY 220-240/380-420 V, 50 Hz ΔY 255-280/440-480 V, 60 Hz
Protection standard	IP 55
Insulation class	F
Rise of temperature class	B
Cooling method	IC 411
The electric motor fulfils the requirements of standards: EN 60034-1, IEC 60072, DIN/VDE 0530.	
Electric motor, 4-pole	0.75 kW
Rated current	3.5 A at 230 V and 2.0 A at 400 V, 50 Hz*
Electric motor, 4-pole	1.5 kW
Rated current	6.1 A at 230 V and 3.5 A at 400 V, 50 Hz*
Electric motor, 4-pole	2.2 kW
Rated current	8.5 A at 230 V and 4.8 A at 400 V, 50 Hz*
Electric motor, 4-pole	3.0 kW
Rated current	11.3 A at 230 V and 6.6 A at 400 V, 50 Hz*
* Approximate values depending on make of motor.	
The motor should be overload protected.	

Construction and advantages

- The special design of the pressure relief groove ensures low flow pulsations and low noise level.
- Double-feed gerotor provides excellent suction ability.
- Dual shaft bearings provides for long service life.
- The design of the pressure chambers ensures low pressure pulsations.
- Few internal parts make the pump light and compact. Many areas of use QPM3 is ideal for:
- circulation of oil in cooling and oil filter systems,
- circulation of oil in industrial hydraulic systems,
- filling and draining of oil in tanks,
- transfer of oil in stationary or mobile oil storage depots.

Options

In case where the QPM3 is installed in an environment where water could enter the electric motor from above, a protective shield should be used. The protective shield is available as an option.

What to consider before installation

- We recommend to install the QPM3 in a horizonal position.
- Minimise the difference in height between the pump inlet and the tank fluid level, preferably with the pump below the tank fluid level (max. 5 m).
- Use by-pass valves if the system is fitted with shutoff valves etc. or if the pump is exposed to cold starts.
- A low suction height and a short inlet line provide optimum pump performance. The diameter of the inlet line must be equal to, or larger than, the pump connection.
- For long service life, oil cleanliness should, according to ISO 4406, not be below 17/15.
- Can be fitted as required in steps of 90° in relation to the electric motor.

Many areas of use

QPM3 is ideal for:

- The electric motor may be overloaded due to cold starting and operation with viscous fluids – choose the right electric motor!
- Oil temperature must not exceed 100°C. In the event of higher temperature, always consult your local Olaer office.
- Recommended ambient temperature –20°C – +40°C.
- Recommended max. working pressure: 10 bar. For operation at
  higher working pressures, consult your local Olaer office.
- Maximum oil viscosity: 800 cSt.
- Maximum suction side pressure: 0.5 bar.
- Maximum negative pressure in inlet line: 0.4 bar with oil filled pump.

How to Order QPM3

Key for QPM3 Gerotor pump

QPM3 - XX - X - XX - XXXX - XXXX

- **- XX** — Pump capacity l/min 10-80
- **- X** — Number of poles 4, (6), 8
- **- XX** — Electric motor power in kW 0,25 - 3
- **- XXXX** — By-pass valve*

BI 5	(5 bar internal)
BI 10	(10 bar internal)
BE 5	(5 bar external)
BE 10	(10 bar external)

- **- XXXX** — When ordering a special pump, the product, components and performance must be written out clearly in full*.

* To be omitted if not required

Note:

Parker Worldwide

Europe, Middle East, Africa

AE – United Arab Emirates, Dubai
Tel: +971 4 8127100
parker.me@parker.com

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe, Wiener Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AZ – Azerbaijan, Baku
Tel: +994 50 22 33 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BY – Belarus, Minsk
Tel: +375 17 209 9399
parker.belarus@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HU – Hungary, Budaoers
Tel: +36 23 885 470
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

KZ – Kazakhstan, Almaty
Tel: +7 7273 561 000
parker.easteurope@parker.com

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Asker
Tel: +47 66 75 34 00
parker.norway@parker.com

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal, Leca da Palmeira
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

UA – Ukraine, Kiev
Tel +380 44 494 2731
parker.ukraine@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

North America

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

US – USA, Cleveland (industrial)
Tel: +1 216 896 3000

US – USA, Elk Grove Village (mobile)
Tel: +1 847 258 6200

Asia Pacific

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

CN – China, Shanghai
Tel: +86 21 2899 5000

HK – Hong Kong
Tel: +852 2428 8008

IN – India, Mumbai
Tel: +91 22 6513 7081-85

IN – India, Bangalore
Tel: +91 80 2843 7690/91

JP – Japan, Fujisawa
Tel: +81 (0)4 6635 3050

KR – South Korea, Seoul
Tel: +82 2 559 0400

MY – Malaysia, Shah Alam
Tel: +60 3 7849 0800

NZ – New Zealand, Mt Wellington
Tel: +64 9 574 1744

SG – Singapore
Tel: +65 6887 6300

TH – Thailand, Bangkok
Tel: +662 717 8140

TW – Taiwan, Taipei
Tel: +886 2 2298 8987

South America

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

BR – Brazil, Cachoeirinha RS
Tel: +55 51 3470 9144

CL – Chile, Santiago
Tel: +56 2 623 1216

MX – Mexico, Apodaca
Tel: +52 81 8156 6000

China

Shanghai Office
Tel:+86 21 2899 5000

BeiJin Office
Tel:+86 10 6561 0520

Guang Zhou Office
Tel:+86 20 3212 1688

ChenDu Office
Tel:+86 28 6180 6800

DaLian Office
Tel:+86 411 3964 6768

ChangSha Office
Tel:+86 731 453 0210

XiAn Office
Tel: +86 29 6851 8950