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sealing & shielding



Oil Coolers For Temperature Optimization In Hydraulic Systems

Catalog HY10-1700/Americas



ENGINEERING YOUR SUCCESS.



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



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

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

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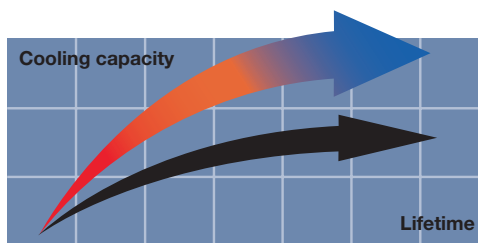
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Parker is a global player specializing in innovative, efficient system solutions for temperature optimization and energy storage. All over the world, our products are working in the most diverse environments and applications.

Oil Coolers

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



Overheating – an expensive problem

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

Temperature optimization – a basic prerequisite for cost-efficient operation

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

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

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

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



ULAC with AC Motor

For industrial use – maximum cooling capacity 400 HP*

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

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

Easy to maintain and easy to retrofit into many applications.

Quiet fan design due to optimization of material and blade.

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

Cooler core with low pressure drop and high cooling capacity.



ULOC Cooling System

For industrial use – maximum cooling capacity 60 HP

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

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

Easy to maintain and easy to retrofit in many applications.

Compact design and low weight.

Quiet fan and pump.

Cooler core with low pressure drop and high cooling capacity.



ULDC with DC Motor

For mobile use – maximum cooling capacity 40 HP

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

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

Easy to maintain and easy to retrofit into many applications.

DC motor 12V/24V

Quiet fan and fan motor.



ULHC with Hydraulic Motor

For mobile and industrial use – maximum cooling capacity 215 HP

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

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

Easy to maintain and easy to retrofit into many applications.

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

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

Quiet fan design due to optimization of material and blade.

Cooler core with low pressure drop and high cooling capacity.



OAW Cooling System

For mobile and industrial use – maximum cooling capacity 274 HP

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

Compact design for easy installation.

Turbulent water flow prevents clogging and reduces maintenance.

Low water consumption for economical operation.

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

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



*At 250 gpm and 70 °F ITD

More Cooling Per \$

with precise calculations and our engineers' support

Optimal sizing produces efficient cooling.

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

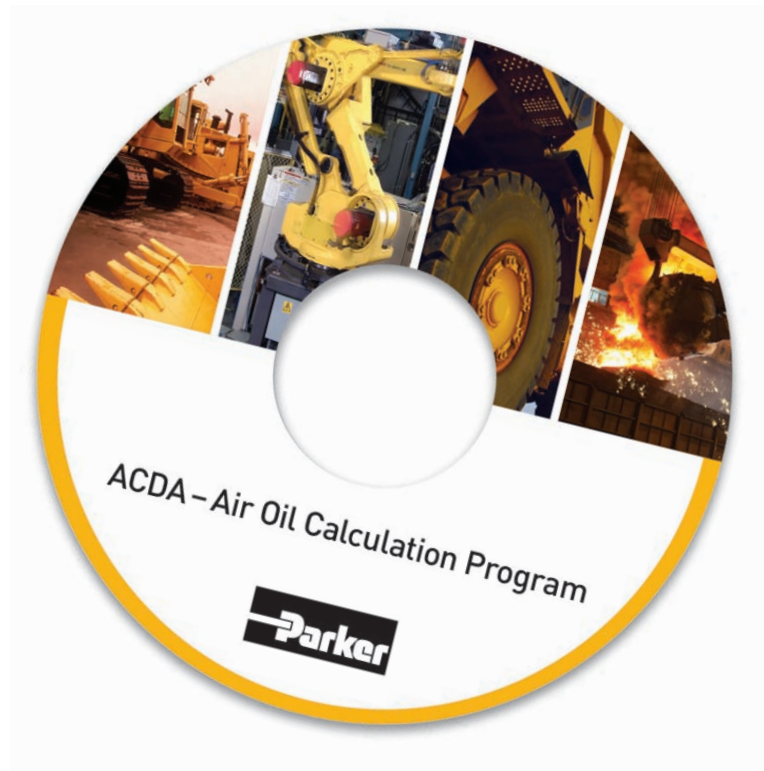
In-depth system review as an added value.

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

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

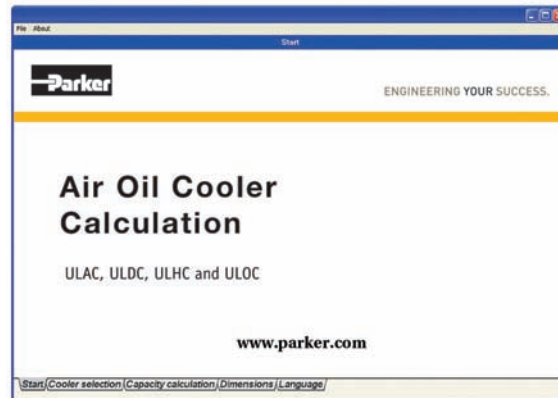
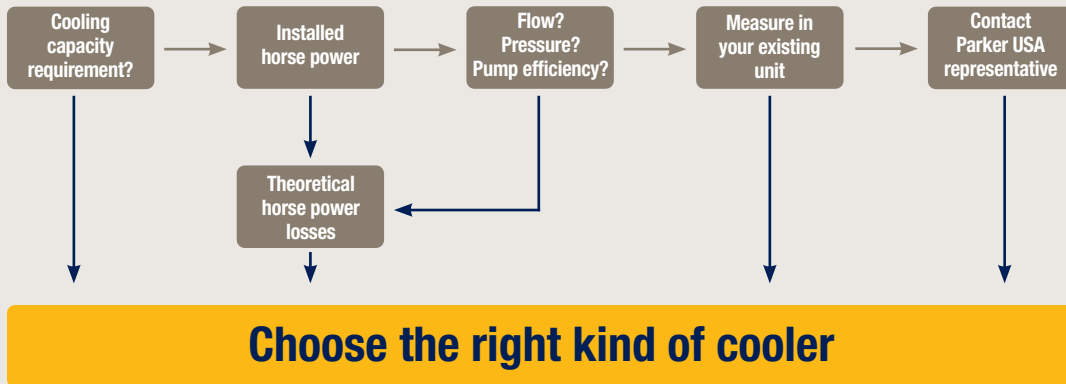
A continual desire for more cost efficient and environmentally friendly hydraulic systems requires continuous development. Areas where we are continuously seeking to improve performance include cooling capacity, noise level, pressure drop and fatigue.

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



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

Calculate the cooling capacity requirement



Enter your values ...

The image shows two screenshots of the software interface. The left screenshot displays the 'Cooler selection' screen with various input fields for 'Type of oil', 'Type of cooler', and 'Cooling system'. The right screenshot shows the 'Capacity calculation' screen with 'Theoretical flow' and 'Theoretical weight' values. Below these is a detailed technical drawing of the ULDC-011 cooler, showing dimensions and a 3D perspective view. A table of specifications is also visible.

ULDC-011	
Model	ULDC-011
Flow	100 GPM
Max. oil temperature	180 °F
Max. air temperature	120 °F
Max. pressure	100 PSI
Max. flow	100 GPM
Max. weight	100 LBS

... get suggested solution

ULDC With DC Motor

For mobile use – cooling capacity up to 40 HP

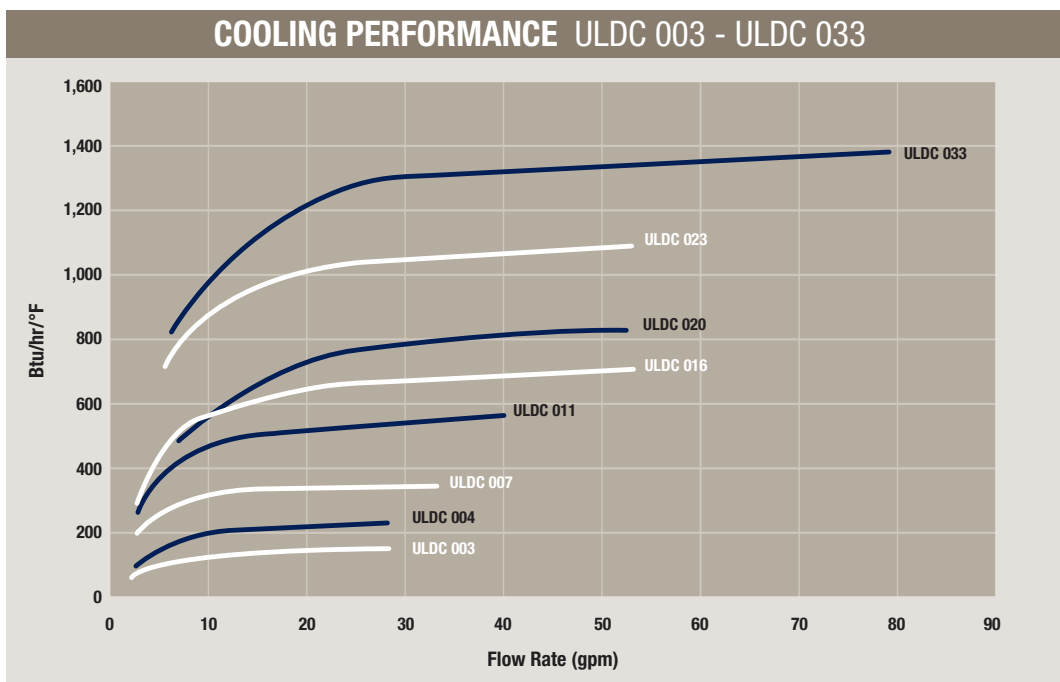


The ULDC oil cooler with 12 or 24V DC motor is optimized for use in the mobile industry. Together with a wide range of accessories, the ULDC cooler is suitable for installation in most applications and environments.

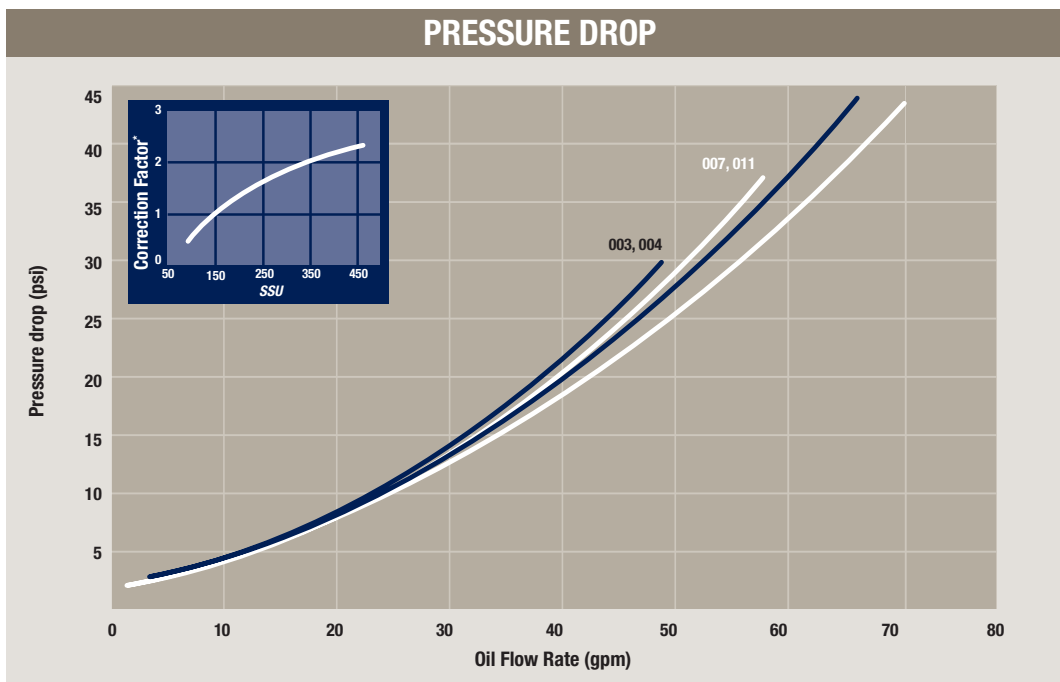
- **Optimized design with right choice of materials and components ensures a reliable and long lasting cooler with low service and maintenance costs.**
- **Compact design resulting in lighter weight unit yet with higher cooling capacity and lower pressure drop.**
- **Easy to maintain and easy to retrofit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

ULDC Cooling Performance

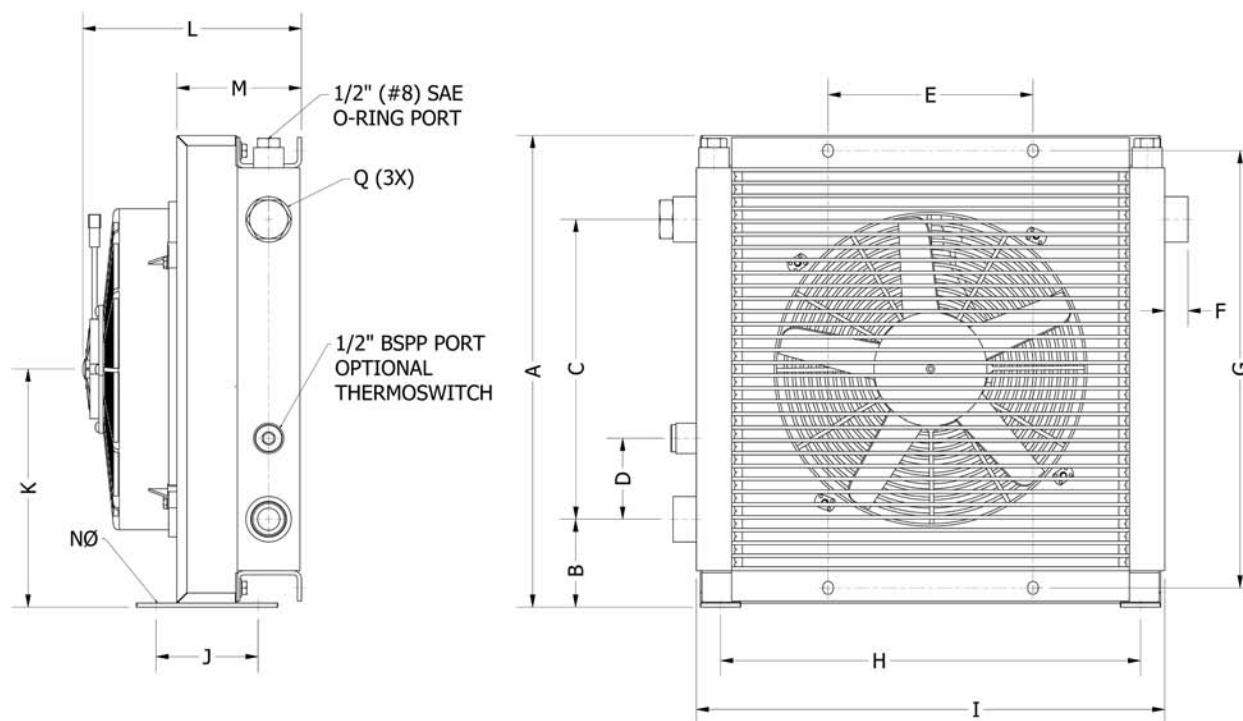
The cooling capacity curves are based on an ETD (Entering Temperature Difference) of 1 °F. For example, oil temperature of 140 °F and air temperature of 70 °F yields a temperature difference of 70 °F. Multiply the number from the cooling graphs corresponding to the specific flow rate by the ETD for the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



Cooling capacity tolerance $\pm 10\%$.



* Pressure Drop Correction Factor for other viscosities.



TYPE	Weight lbs (Approx.)	Acoustic Pressure LpA dB(A) 3 Ft.*	Max. Current (Amps.)**		Q SAE O-Ring Boss
			12 Volts	24 Volts	
ULDC 003	11	68	9	3	1" (#16)
ULDC 004	13	63	7	4	1" (#16)
ULDC 007	20	71	13	6	1" (#16)
ULDC 011	26	75	20	12	1" (#16)
ULDC 016	33	75	20	12	1" (#16)
ULDC 020	40	82	20	10	1" (#16)
ULDC 023	55	75	20	12	1" (#16)
ULDC 033	66	75	20	12	1 1/4" (#20)

* Noise level tolerance ± 3 dB(A).

** ULDC-023 & ULDC-033 Cooler assemblies come with two fans each. The indicated max. current is for one fan only.

TYPE	A	B	C	D	E	F	G	H	I	J	K	L	M	Nø dia./oblong
ULDC 003	8.9	2.5	3.5	-	5.2	0.9	7.8	5.3	9.6	5.8	4.6	5.9	4.1	0.35 x 0.55
ULDC 004	10.0	3.5	3.5	-	6.0	0.9	9.0	5.3	10.5	5.8	5.2	6.0	4.3	0.35 x 0.55
ULDC 007	13.3	3.7	6.3	3.2	8.0	0.9	11.7	8.0	13.0	10.5	6.8	6.8	4.3	0.35
ULDC 011	15.6	3.4	9.0	3.2	8.0	0.9	14.3	14.2	15.7	4.0	7.9	8.5	4.9	0.35 x 1.1
ULDC 016	18.3	3.4	11.7	3.2	8.0	0.9	17.0	16.4	18.3	4.0	9.3	8.3	4.8	0.35 x 1.1
ULDC 020	20.1	3.0	13.8	2.8	8.0	0.9	18.7	18.5	20.1	4.0	10.1	8.3	4.9	0.35 x 0.55
ULDC 023	25.0	5.4	14.9	3.2	14.0	-	20.2	-	24.2	11.4	7.9/18.0	8.6	4.9	0.51
ULDC 033	26.7	3.4	19.1	3.2	14.0	1.0	24.5	-	25.0	11.4	7.9/18.0	10.1	6.5	0.51

All dimensions listed above are in inches.

Order Key for ULDC Oil Coolers

All positions must be filled in when ordering.

EXAMPLE:					
ULDC	-	007	- A	- 000	- SA
Series		Model	Motor Type	Thermoswitch	Core Bypass
1		2	3	4	5
1. OIL COOLER SERIES WITH DC MOTOR; ULDC					
2. COOLER SIZE/MODEL					
003, 004, 007, 011, 016, 020, 023, 033					
3. MOTOR VOLTAGE					
12 V					= A
24 V					= B
4. THERMOSWITCH					
No thermoswitch					= 000
100 °F					= 100
120 °F					= 120
140 °F					= 140
160 °F					= 160
175 °F					= 175
195 °F					= 195
Not listed, consult Accumulator and Cooler Division					= ZZZ
5. CORE BYPASS*					
No Bypass					= SW
20 psi External Hose Bypass (standard option)					= SA
65 psi External Hose Bypass (standard option)					= SB
30 psi External Tube Bypass					= SG
75 psi External Tube Bypass					= SH
120 psi External Tube Bypass					= SJ
120 °F External Thermo-Bypass					= SM
140 °F External Thermo-Bypass					= SN
160 °F External Thermo-Bypass					= SP
195 °F External Thermo-Bypass					= SQ
Full Flow External Bypass					= SF
* The standard cores are single pass. Two pass cores and other options available upon request, please consult Accumulator and Cooler Division.					

Technical Specifications

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



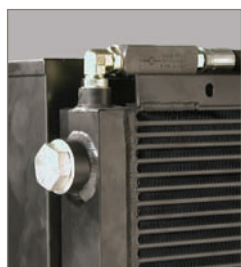
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Take the next step

Choose the right accessories

Supplementing a hydraulic system with a cooler and proper accessories or an accumulator gives you increased system up time and a longer expected life as well as lower service and repair costs. All applications and operating environments

are unique. A well-planned choice of the following accessories can thus further improve your hydraulic system. Please contact Accumulator and Cooler Division for guidance and information.



Pressure-controlled bypass valve *Integrated*

Allows the oil to bypass the cooler core if the pressure drop is too high. Reduces the risk of the cooler bursting, e.g. in connection with cold starts and temporary peaks in pressure or flow. Available for single-pass or two-pass core design.



Smart DC Drive speed regulation

For cost-efficient operation and better environmental consideration through speed regulated fan control – the higher the temperature, the higher the fan speed.



Temperature-controlled bypass valve *Integrated*

Same function as the pressure-controlled by-pass valve, but with a temperature-controlled opening pressure – the hotter the oil, the higher the opening pressure. Available for single-pass or two-pass core design.



Stone guard/Dust guard

Protects components and systems from tough conditions.



Thermo contact

Sensor with fixed set point for temperature warnings and cost efficient operation with automatic switching on and off of the fan motor thereby reducing the energy usage.



Temperature-controlled 3-way valve *External*

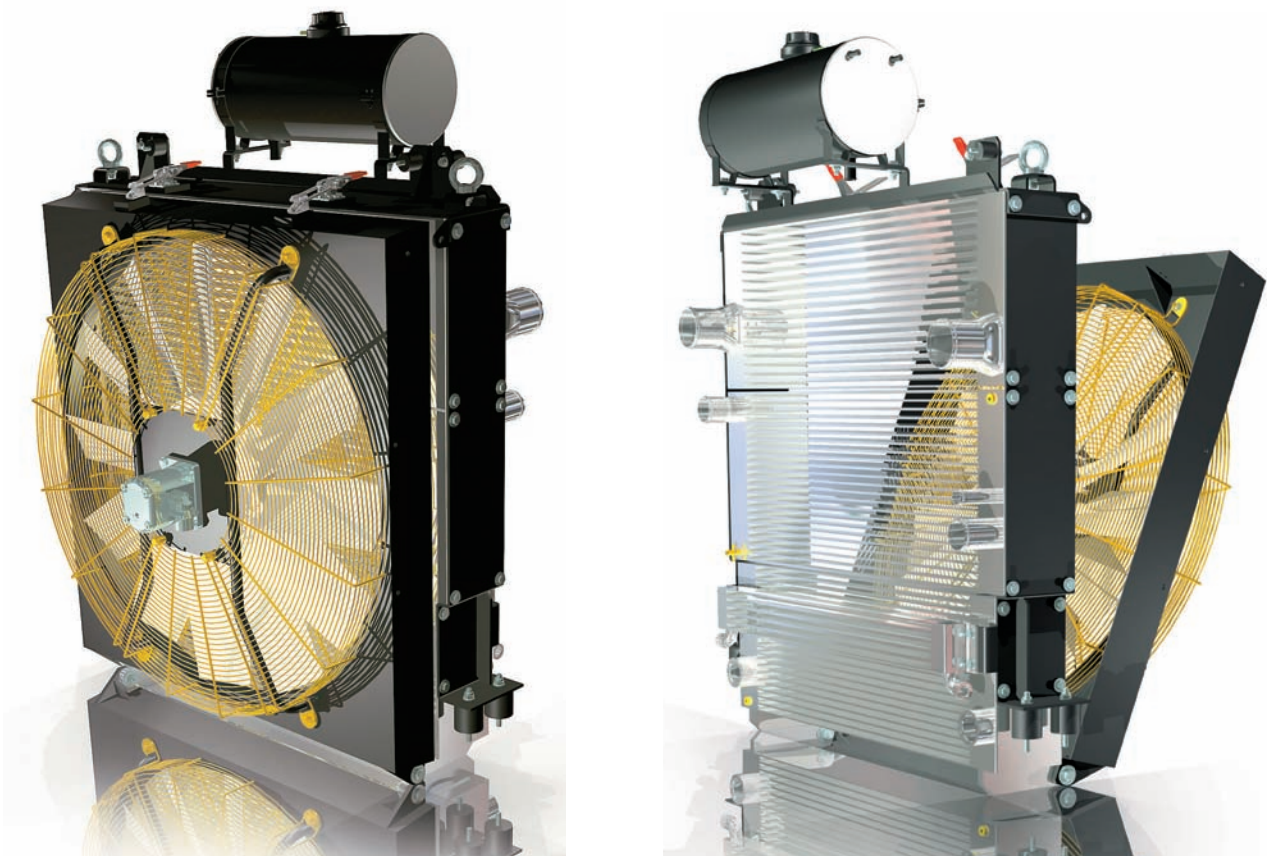
Same function as the temperature-controlled bypass valve, but positioned externally.

Note: *Must be ordered separately.*



Lifting eyes

For simple installation and relocation.



Professional competence, as well as advanced technology and extensive knowledge from the industry, allow us to provide many cooler combinations, which meet your unique needs.

Cooling Modules/ Combination Cooler

Providing optimal solutions

A close collaboration between our application engineers, designers and you as the customer during the whole project will result in a high-quality product. The final product will be a tailor-made cooler, which always meets your unique needs.

Extensive choices

Long-term experience from the mobile field has provided us with a unique ability to deliver the

ideal combination cooler solution. Depending on the conditions, the cooler fan can be operated by the diesel engine on the machine or by a hydraulic motor or a DC motor. We can also supply many different cooler combination options. A frequent combination is the “side-by-side”-cooler, where the coolers are placed side-by-side, no matter the media, such as a water cooler, an oil cooler and an intercooler. Another solution is

the “sandwich”-cooler, where the coolers are placed in front of each other. The solution could also be a combination of these two. No matter which combination will be used, the pressure drop and the heat dissipation across the core will always be optimal.

Parker's Motion & Control Product Groups

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 1 800 C-Parker (1 800 272 7537)



Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes



Automation

Key Markets

Renewable energy
Conveyor & material handling
Factory automation
Food & beverage
Life sciences & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery
Primary metals
Safety & security
Semiconductor & electronics
Transportation & automotive

Key Products

AC/DC drives & systems
Air preparation
Electric actuators, gantry robots & slides
Human machine interfaces
Inverters
Manifolds
Miniature fluidics
Pneumatic actuators & grippers
Pneumatic valves & controls
Rotary actuators
Stepper motors, servo motors, drives & controls
Structural extrusions
Vacuum generators, cups & sensors



Climate & Industrial Controls

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Power Generation
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO₂ controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermal management systems
Thermostatic expansion valves



Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems



Fluid Connectors

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings



Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors



Instrumentation

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves



Seal

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening



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