



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



## Air Oil Coolers

LDC with DC Motor for Mobile Use



ENGINEERING YOUR SUCCESS.



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

# LDC Air Oil Coolers

For mobile use - maximum cooling capacity 30 kW

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.

### Overheating - an expensive problem

An under-sized cooling capacity produces a temperature balance that is too high. The

consequences are poor lubricating properties, internal leakage, a higher risk of cavitation, damaged components, etc. Overheating leads to a significant drop in cost-efficiency and environmental consideration.

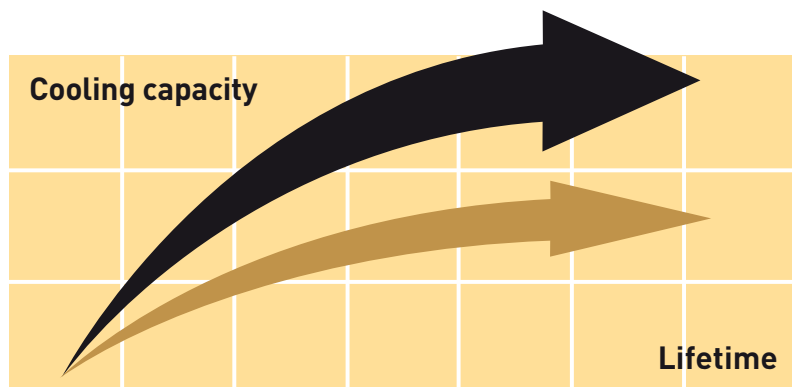
### Temperature optimisation - a basic prerequisite for cost-efficient operation

Temperature balance in a hydraulic system occurs when the cooler can cool down the energy input that the system does not consume - the system's lost energy ( $P_{loss} = P_{cool} = P_{in} - P_{used}$ ). Temperature optimisation means that temperature balance occurs at the system's ideal working temperature - the temperature at which the oil's viscosity and the air content

comply with recommended values.

### The correct working temperature produces a number of economic and environmental benefits:

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



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

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.



Smart DC Drive speed regulation

## Smart DC Drive

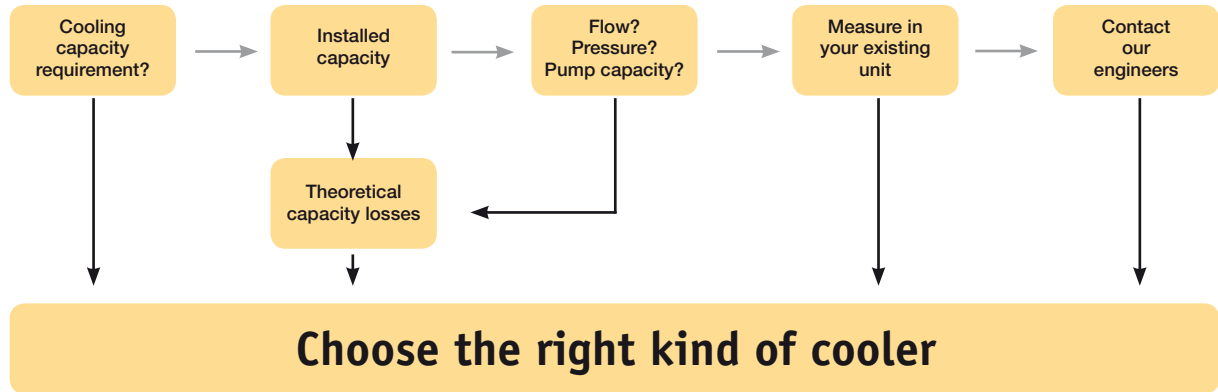
Smart DC Drive for soft start of fan, as well as lower power consumption and sound level by

means of temperature-controlled speed regulation. Smart DC Drive also eliminates voltage

peaks, thus contributing towards a longer useful life for the fan motor.



# Calculate the Cooling Capacity Requirement

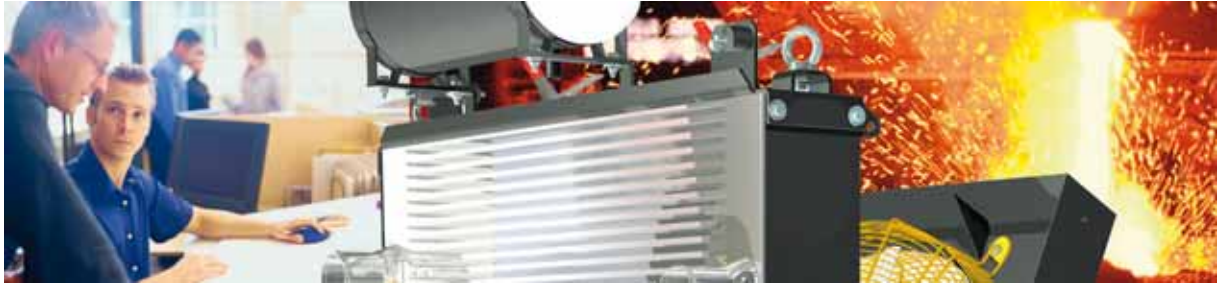


Enter your values ....

The image shows two screenshots of the software interface. The left screenshot displays various input fields for 'Type of cooler', 'Cooling capacity', and 'Flow rate'. The right screenshot shows the 'Cooling capacity' field set to 4.0 and 'Flow rate' set to 20. Below these screenshots is a detailed technical drawing of the LAC2 011-4-0 cooler, including a side view, a top view, and a perspective view. The drawing includes dimensions and a small image of the physical cooler unit. A data sheet for the LAC2 011-4-0 is also visible, listing technical specifications.

... suggested solution





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

## More Cooling per €

with precise calculations and our engineers' support

Optimal sizing produces efficient cooling. Correct sizing requires knowledge and experience. Our calculation program, combined with our engineers' support, gives you access to this very knowledge and experience. The result is more cooling per € invested. The user-friendly calculation program can be downloaded from [www.olaer.se](http://www.olaer.se)

### Valuable system review into the bargain

A more wide-ranging review of

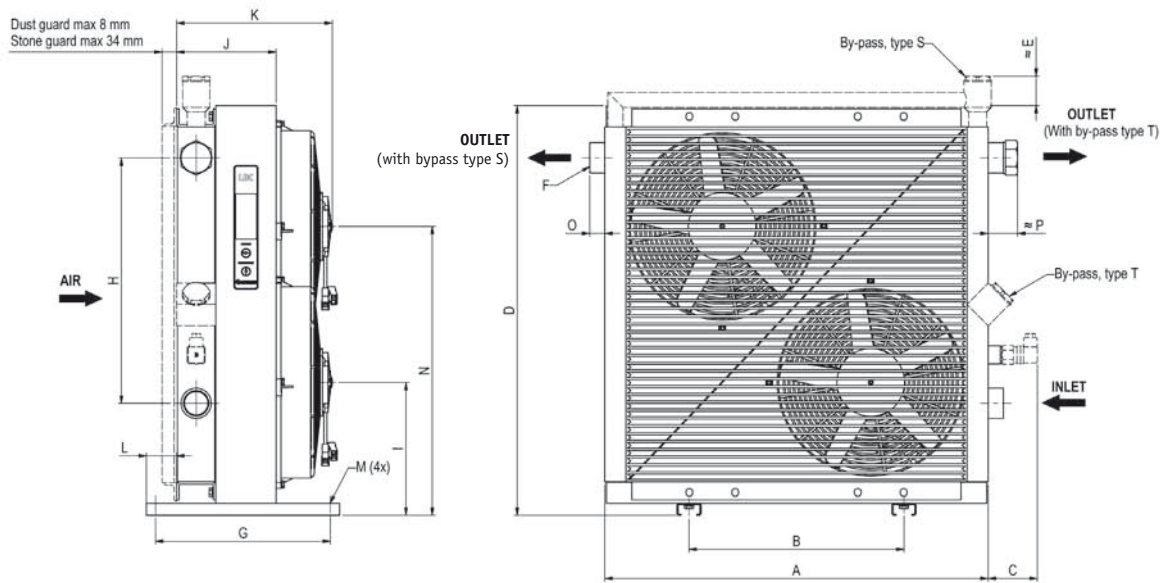
the hydraulic system is often a natural element of cooling calculations. Other potential system improvements can then be discussed – e.g. filtering, offline or online cooling, etc. Contact us for further guidance and information.

### Parker Hannifin's quality and performance guarantee insurance for your operations and systems

A constant striving towards more cost-efficient and environment friendly hydraulic systems

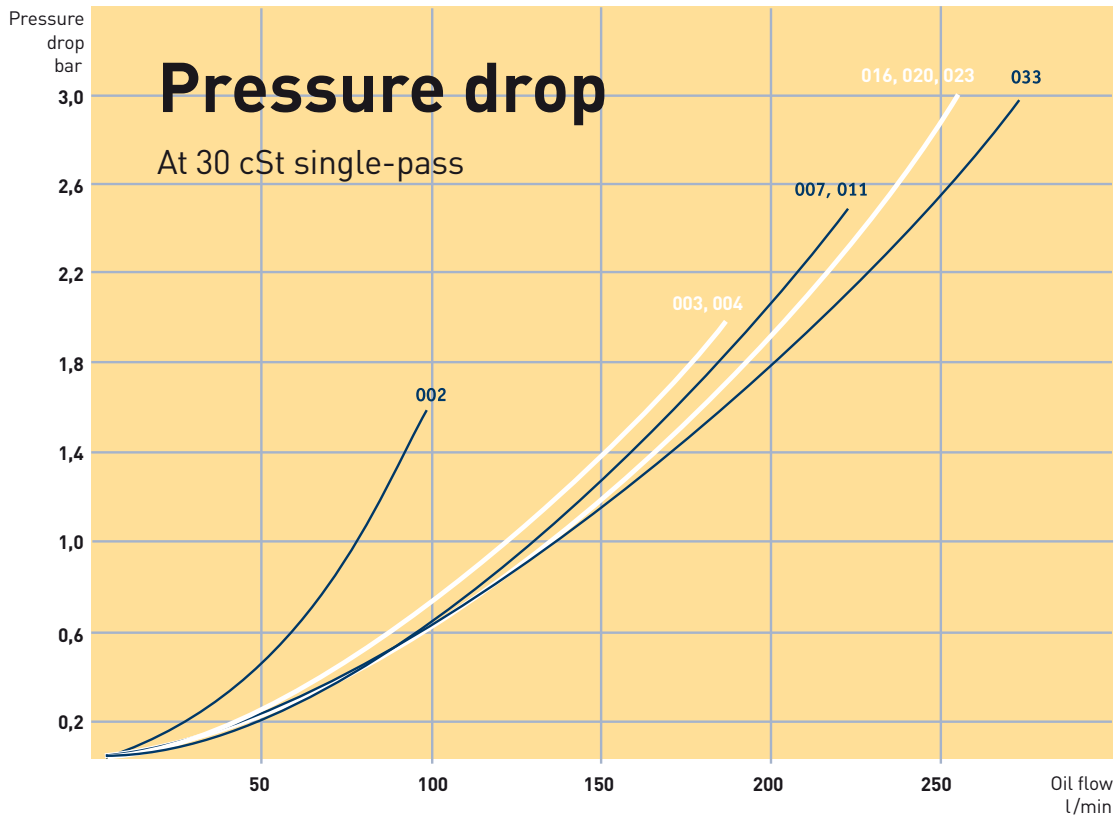
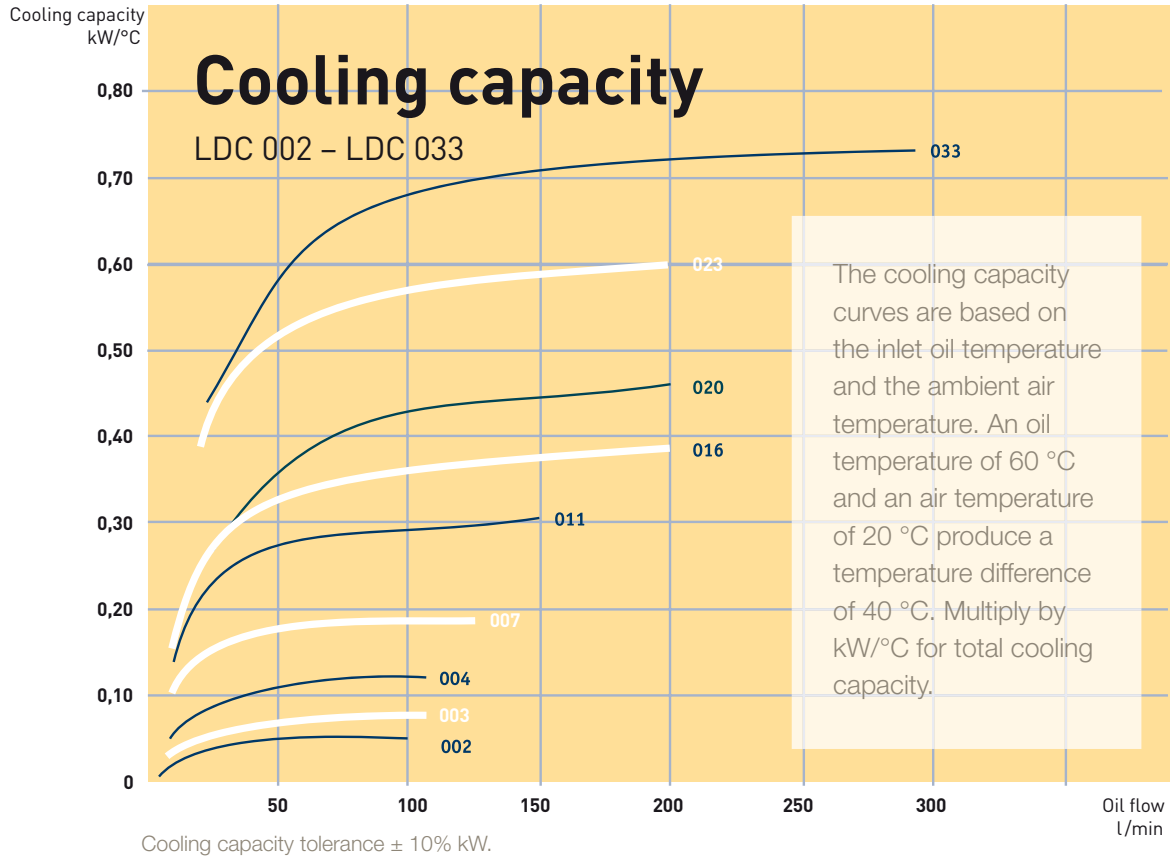
requires continuous development. Areas where we are continuously seeking to improve performance include cooling capacity, noise level, pressure drop and fatigue. Meticulous quality and performance tests are conducted in our laboratory. All tests and measurements take place in accordance with standardised methods - cooling capacity in accordance with EN1048, noise level ISO 3743, pressure drop EN 1048 and fatigue ISO 10771-1.





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  $\pm 3$  dB(A)



# Key for LDC Air Oil Coolers

All positions must be filled in when ordering

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

## 1. AIR OIL COOLER WITH DC MOTOR = LDC

## 2. COOLER SIZE

002, 003, 004, 007, 011, 016, 020, 023, 033

## 3. MOTOR VOLTAGE

12 V = A  
 24 V = B

## 4. Accessories for DC Motor

No motor accessories = 0  
 Smart DC Drive, soft start. Requires a thermo contact pos.5 = S

## 5. THERMO CONTACT

No thermo contact = 00  
**Thermo contact Smart DC Drive**  
 40 °C = 40 45 °C = 40  
 50 °C = 50 50 °C = 50  
 60 °C = 60 55 °C = 55  
 70 °C = 70 60 °C = 60  
 80 °C = 80 75 °C = 75  
 90 °C = 90 95 °C = 95

## 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 LDC 002 - LDC 004

## 7. MATRIX GUARD

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

## 8. STANDARD/SPECIAL

Standard = O  
 Special = Z

## TECHNICAL SPECIFICATION

### FLUID COMBINATIONS

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

### MATERIAL

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

## COOLER MATRIX

Maximum static working pressure	21 bar
Dynamic working pressure	14 bar*
Maximum oil inlet temperature	120 °C

\* Tested in accordance with ISO/DIS 10771-1

## ELECTRIC MOTOR

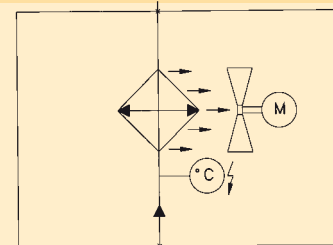
### COOLING CAPACITY CURVES

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

## CONNECTION CHART



Connection chart for LDC air oil cooler.

LDC	002	003	004	007-020	023-033
Speed (rpm)	3 700	3 670	3 350	3 060	3 060
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

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







With our specialist expertise, industry knowledge and advanced technology, we can offer a range of different solutions for coolers and accessories to meet your requirements.

## Take the Next Step

- choose the right accessories

Supplementing a hydraulic system with a cooler, cooler accessories and an accumulator gives you increased availability and a longer useful 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 Parker Hannifin for guidance and information.



### Pressure-controlled bypass valve *Integrated*

Allows the oil to bypass the cooler matrix 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 matrix design.



### Thermo contact

Sensor with fixed set point, for temperature warnings. Can be used for more cost-efficient operation and better environmental consideration through the automatic control of the fan motor, either on or off.



### Temperature-controlled bypass valve *Integrated*

Allows the oil to bypass the cooler matrix if the pressure drop is higher than 2,2 bar or less than the chosen temperature. The bypass closes when the oil temperature increases. Different closing temperatures available. Available for singlepass or two-pass matrix design



### Smart DC Drive speed regulation

For cost-efficient operation and better environmental consideration through speed regulated fan control. Activated by chosen temperature.



### Temperature-controlled 3-way valve *External*

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

*Note: must be ordered separately.*



### Stone guard/Dust guard

Protects components and systems from tough conditions.



# Motion & Control Technologies

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 information, call our European Product Information Centre at 00800 27 27 53 74.



## AEROSPACE

### Key Markets

- Aircraft engines
- Business and general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles and launch vehicles
- Regional transports
- Unmanned aerial vehicles

### Key Products

- Flight control systems and components
- Fluid conveyance systems
- Fluid metering delivery and atomization devices
- Fuel systems and components
- Hydraulic systems and components
- Inert nitrogen generating systems
- Pneumatic systems and components
- Wheels and brakes



## CLIMATE CONTROL

### Key Markets

- Agriculture
- Air conditioning
- Food, beverage and dairy
- Life sciences and medical
- Precision cooling
- Processing
- Transportation

### Key Products

- CO<sub>2</sub> controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hoses and fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves



## ELECTROMECHANICAL

### Key Markets

- Aerospace
- Factory automation
- Food and beverage
- Life science and medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastics machinery and converting
- Primary metals
- Semiconductors and electronics
- Textile
- Wire & cable

### Key Products

- AC/DC drives and systems
- Electric actuators
- Controllers
- Gantry robots
- Gearheads
- Human machine interfaces
- Industrial PCs
- Inverters
- Linear motors, slides and stages
- Precision stages
- Stepper motors
- Servo motors, drives and controls
- Structural extrusions



## FILTRATION

### Key Markets

- Food and beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil and gas
- Power generation
- Process
- Transportation

### Key Products

- Analytical gas generators
- Compressed air and gas filters
- Condition monitoring
- Engine air, fuel and oil filtration and systems
- Hydraulic, lubrication and coolant filters
- Process, chemical, water and microfiltration filters
- Nitrogen, hydrogen and zero air generators



## FLUID & GAS HANDLING

### Key Markets

- Aerospace
- Agriculture
- Bulk chemical handling
- Construction machinery
- Food and beverage
- Fuel and gas delivery
- Industrial machinery
- Mobile
- Oil and gas
- Transportation
- Welding

### Key Products

- Brass fittings & valves
- Diagnostic equipment
- Fluid conveyance systems
- Industrial hoses
- PTFE and PFA hoses, tubing and plastic fittings
- Rubber and thermoplastic hoses and couplings
- Tube fittings and adapters
- Quick disconnect couplings



## HYDRAULICS

### Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil and gas
- Power generation and energy
- Truck hydraulics

### Key Products

- Diagnostic equipment
- Hydraulic cylinders and accumulators
- Hydraulic motors and pumps
- Hydraulic systems
- Hydraulic valves and controls
- Power take-offs
- Rubber and thermoplastic hoses and couplings
- Tube fittings and adapters
- Quick-disconnect couplings



## PNEUMATICS

### Key Markets

- Aerospace
- Conveyor and materials handling
- Factory automation
- Food and beverage
- Life science and medical
- Machine tools
- Packaging machinery
- Transportation and automotive

### Key Products

- Air preparation
- Compact cylinders
- Field bus valve systems
- Grippers
- Guided cylinders
- Manifolds
- Miniature fluidics
- Pneumatic accessories
- Pneumatic actuators and grippers
- Pneumatic valves and controls
- Rodless cylinders
- Rotary actuators
- Tie-rod cylinders
- Vacuum generators, cups and sensors



## PROCESS CONTROL

### Key Markets

- Chemical and refining
- Food, beverage and dairy
- Medical and dental
- Microelectronics
- Oil and gas
- Power generation

### Key Products

- Analytical sample conditioning products and systems
- Fluoropolymer chemical delivery fittings, valves and pumps
- High purity gas delivery fittings, valves and regulators
- Instrumentation fittings, valves and regulators
- Medium pressure fittings and valves
- Process control manifolds



## SEALING & SHIELDING

### Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil and gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

### Key Products

- Dynamic seals
- Elastomeric O-rings
- EMI shielding
- Extruded and precision-cut, fabricated elastomeric seals
- Homogeneous and inserted elastomeric shapes
- High temperature metal seals
- Metal and plastic retained composite seals
- Thermal management





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### US Product Information Centre

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